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THE SYNTH ISSUE

KORG ARP ODYSSEY REDUX REVIEWED

HANDS ON PREVIEWS

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Moog System 55 Modular

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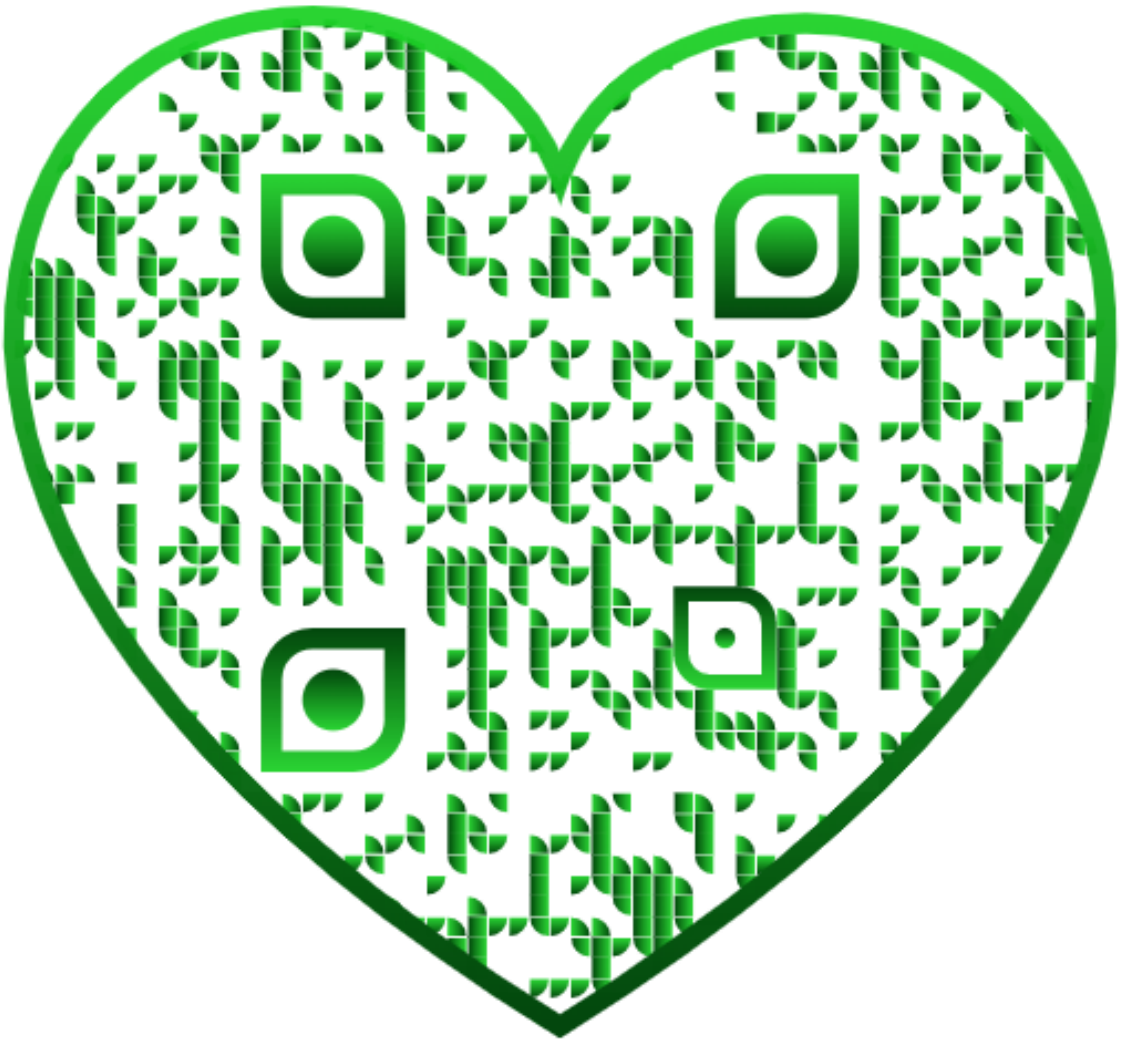

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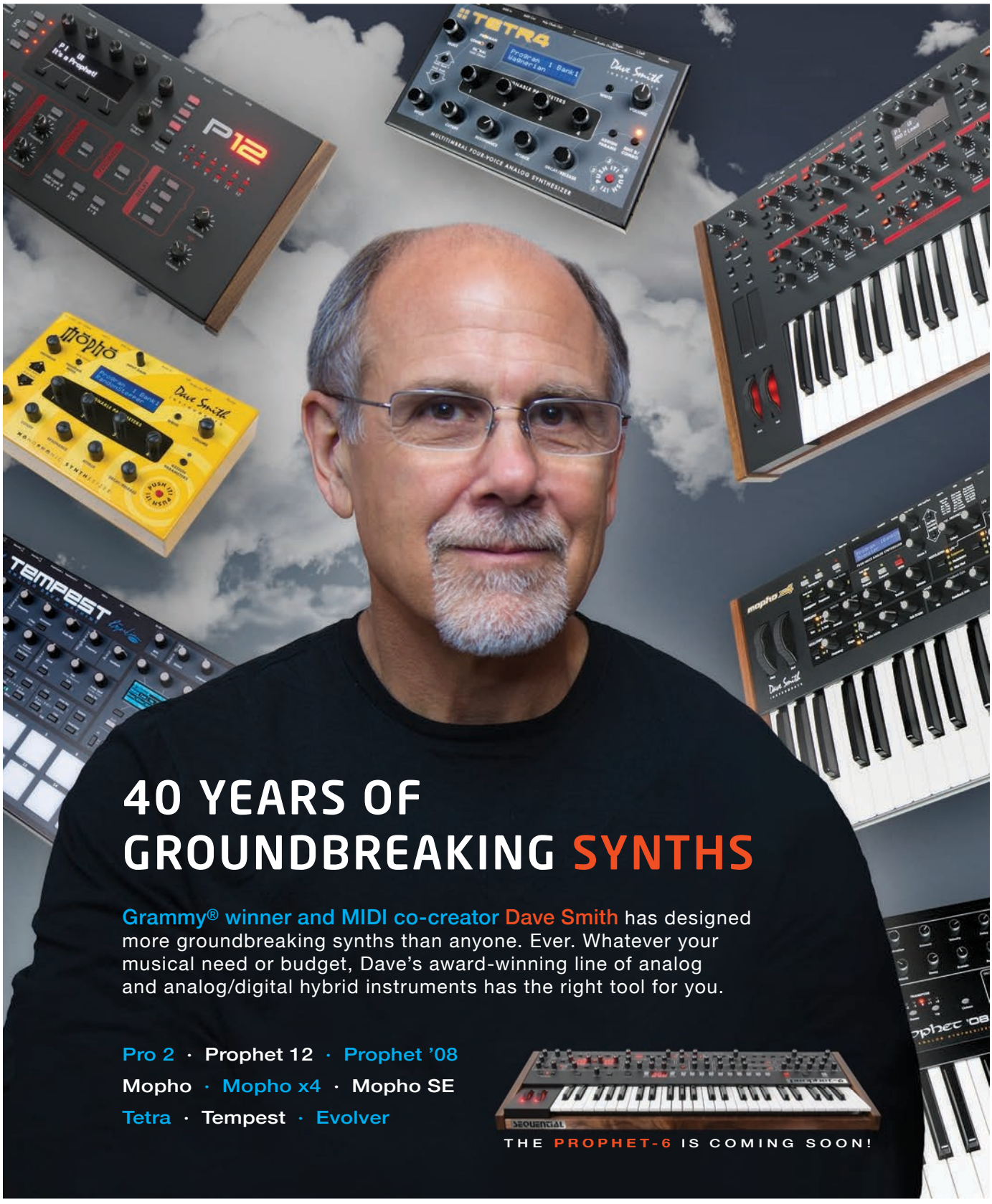
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CONTENTS

MAY 2015

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TALK

8 Voices, tips, and breaking news from the *Keyboard* community.

NEW GEAR SYNTH EDITION

10 In our special synthesizer-focused issue, we bring you first-look coverage of the Dave Smith Instruments Prophet 6, Modal Electronics 002, and Moog's Modular systems, plus ten more new synth releases.

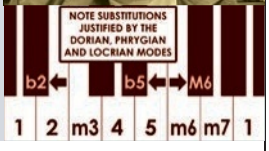
HEAR

16 **ROAD WARRIORS**
In NRBQ's 50th anniversary year, keyboardist and founding member **Terry Adams** discusses his touring gear, and the Monk tribute he's always dreamed of making.

18 **MAKERS**
Analog comeback? For 30 years, **Studio Electronics** has never gone away.

20 **DEPARTURES**
Remembering Tangerine Dream member and electronic music pioneer **Edgar Froese**.

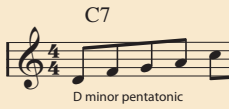
PLAY



22 **BLUES**
Scott Healy shows how to play traditional slow blues.

28 **POP**
David Baron teaches the art of imitating "real instruments" on keys.

30 **BEGINNER**
In his fifth **Key of One** column, Robbie Gennet demystifies the world of modes.

KNOW

32 **SYNTH SOLOING**
We've explored his sound; now dive into the playing style of **Jan Hammer**.

34 **BEYOND THE MANUAL**
Learn tweaks to get more soft synth mileage from your computer.

36 **DANCE**
Making classic sounds with the **ARP**.

REVIEW

38 **ANALOG SYNTH**
Korg **ARP Odyssey**

42 **HYBRID SYNTH**
Roland **JD-Xi**

46 **COMBO AMP**
Spacestation **V.3**

48 **APP**
Arturia **iProphet**

CODA

50 **Chris Carroll** of Vintage Vibe describes five things he has learned about **maintaining vintage electro-mechanical keyboards.**

Online Now!

Exploring the Prophet-6 with **Dave Smith**.

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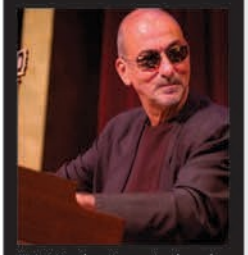

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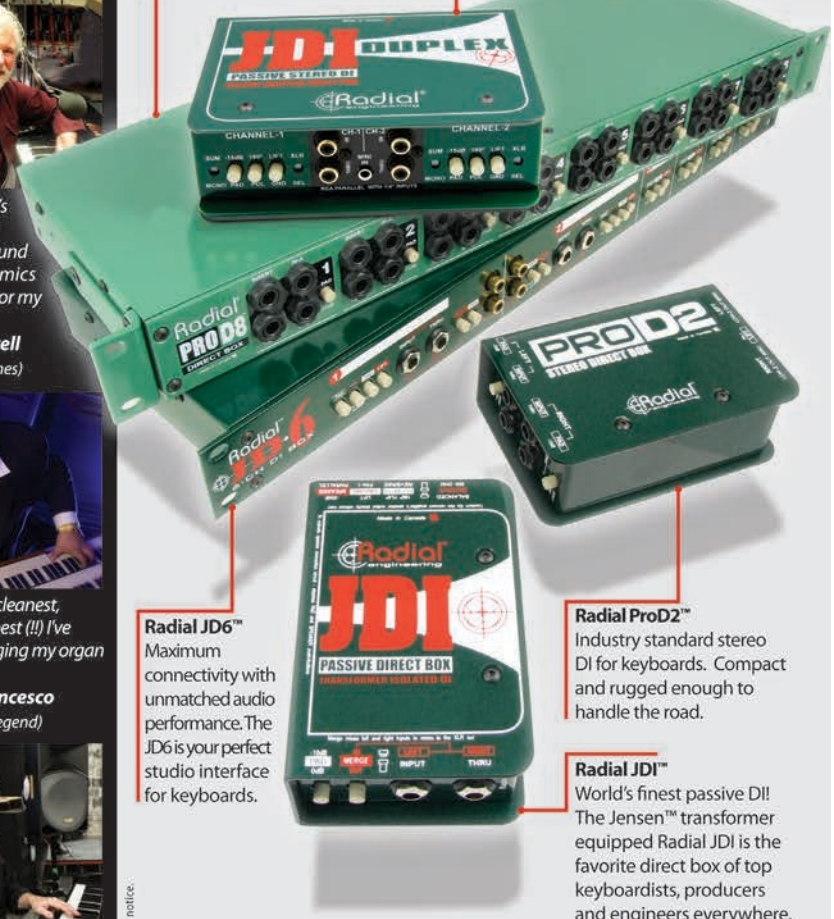

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Editor's Note

Last month's issue, featuring a report from the 2015 Winter NAMM instrument show, was so chock full of synths that they've spilled over into *this* issue. Since then, we've logged more playtime with three of the most buzzed-about—the Sequential Prophet-6, Modal Electronics 002, and Moog's reissued modulars, but haven't yet been able to borrow units for full, evaluative reviews. So we're trying out something different in our "New Gear" section: one-page tech previews based on our encounters with those synths. Full reviews are forthcoming of course, but we'd like to hear from you about this. Do you like this expanded take on our first hands-on impressions, or would you rather just wait for the full review in the magazine—perhaps preferring online videos for your early-scoop delivery? Let me know on email or social media; I'm listening!

On another topic, sincere thanks to the crew at EastWest Studios in Hollywood for making their space available for last month's cover shoot with Maroon 5. The former Oceanway/United Western facility has flourished under Doug Rogers' ownership, and at NAMM I spoke briefly with Bill Putnam Jr. (head of Universal Audio and son of UA and United Western founder Bill Putnam Sr.) about paying a visit to give you a tour of this living hall of music history. Stay tuned . . .

Stephen Fortner

Stephen Fortner
Editor

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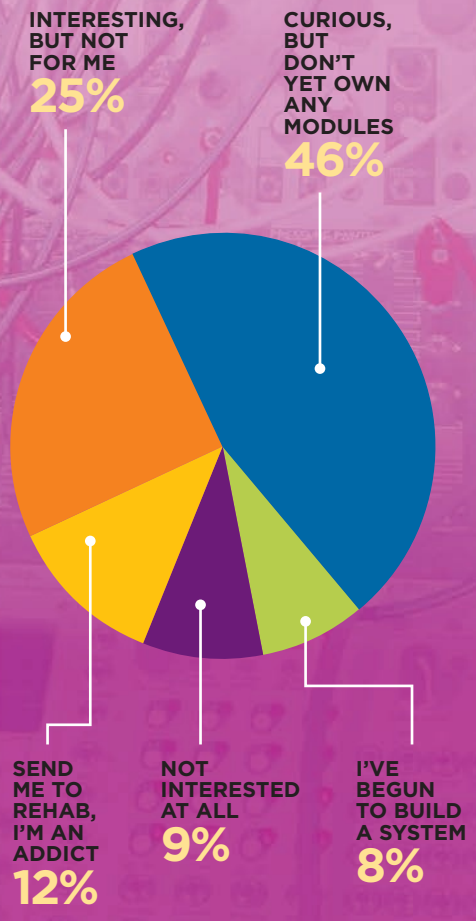
Key Secrets Recorder as iPad Mic

While shopping for a mic for my iPad Mini 2, I strongly considered the Zoom iQ7 (zoom-na.com; $99). This clever gadget connects to the Lightning port on an iPhone, iPad, or iPod to add stereo recording in the flexible mid-side (M-S) format. Then I remembered my Zoom H2n recorder offers M-S *and* X-Y patterns, plus it works as a USB mic and audio interface. The H2n draws too much power to run directly from an iPad through Apple's Camera Connection Kit, but it worked fine through a powered USB hub. Next I'll wire up a battery pack to power the hub for truly mobile recording. David Battino

THE Keyboard POLL

Q: WHAT DO YOU THINK ABOUT MODULAR SYNTHS?



Polls rotate every two weeks, and can be found at the bottom of our homepage.

+ 30 YEARS AGO TODAY

Howard Jones was featured on the cover of our May 1985 issue, in which the British synth pop star talked about his electronic one-man-band approach to performance, and his opinions about sampling and soloing. We also talked to some of the superstar keyboard players—including **Jan Hammer**, **Chuck Leavell**, **Wally Badarou**, **Rob Sabino**, **Bill Laswell**—who appeared on **Mick Jagger**'s solo album *She's the Boss*. Craig Anderton offered a step-by-step, illustrated guide to building your own **vocoder**, and our contributors reviewed three then-new synths: **Roland**'s JX-8P, the updated **PPG** Wave 2.3, and **Korg**'s DW-6000, which was also featured in a two-page ad. Barbara Schultz

Only the Korg DW 6000 gives you the power of digital sound with the simplicity of analog control.
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Talent Scout

DANNY KEAN

BY JON REGEN

RONNIE WRIGHT

Singer, songwriter, and multi-instrumentalist Danny Kean is a monster player. Blind since birth, the New York-based musician delivers screaming organ leads, soulful vocals, and bluesy guitar solos, sometimes simultaneously. Find out more at dannykeanmusic.com.

FIRST GIGS: Aside from talent shows and piano bars, my first gigs of substance were at age 17 with a regionally successful band. We were working six nights a week. Within a year, I became their lead singer and my left hand became their bass player!

INFLUENCES: Early on it was all about Joe Sample, Billy Preston, Otis Spann, James Booker, Donny Hathaway, Dr. John, Wynton Kelly, Booker T. Jones, Jimmy Smith, Ray Charles, and Stevie Wonder.

WHAT I'M LISTENING TO RIGHT NOW: I vibe on soul music, organ trios, New Orleans funk, and old blues.

MY BIG BREAK: Backing the late Sam "Bluzman" Taylor when I was 19. From there, I had the good fortune to write, record, and tour with rock and soul legends Maxine Brown and Gary U.S. Bonds.

LATEST ALBUM: *Danny Kean* incorporates elements of funk, blues, rock, and gospel, while still staying true to the idiom of soul music. The album closes with an interesting take on Stevie Wonder's classic "Heaven Help Us All."

FAVORITE KEYBOARDS: If it were up to me, I'd have a piano, Rhodes, Wurlitzer, Hammond B-3 organ, and a Clav onstage every night. Nowadays, I use a Yamaha S90 for chords and solos on the bottom tier, and a Yamaha MM6 for horns, strings, and bass on top.

ADVICE: Listen to and play along with as many records as possible. Learn how to speak easily while practicing. This will come in handy when you are either singing or calling out chord changes. Perform onstage as much as possible—there's no substitute for it.

NEW GEAR

SPECIAL PREVIEW
MOOG MUSIC SYSTEM 55
DESIGNED BY COMPOSER DEMAND

BY GINO ROBAIR

THE EARLIEST ANALOG SYNTHS WERE ESSENTIALLY WORKS IN PROGRESS: The technology was so new that designs, materials, and manufacturing techniques were continually being and improved. Thus, to re-create Keith Emerson's legendary modular last year, Moog Music had some serious reverse engineering to do in order to find out why his system, which included custom features, sounded like no other.

The recent reissues of three classic modular Moogs—the System 55, System 35, and Model 15—are based on the designs of the late '70s. Transparencies of the original PCB artwork were used to make the printed circuit boards for these modules.

JOHN GRABOWSKI

Keyboardist and historian Brian Kehew (shown at left), who participated in the reissue process, stresses that many of the module designs were suggested by composers and developed to fulfill customer demand. As an example, Kehew takes us on a quick tour of the System 55, pointing out the historical significance of several designs.

914 FIXED FILTER BANK
"Possibly the most underrated module, but functionally one of the best in the catalog. It was suggested by Wendy Carlos: They'd had fixed filters at Columbia-Princeton University, where she was going to school. Because most traditional instruments have a fixed resonance pattern, by setting the knobs on this module, you can get the bumps and peaks of a real acoustic instrument. It's also useful for carving out space when you have a bunch synth tracks in a mix."

904B VOLTAGE CONTROLLED HIGHPASS FILTER
"Created together with the 904A lowpass filter for the University of Toronto's Gus Ciamaga, not quite a year after the first Moog system, which originally had only oscillators and amplifiers."

960 SEQUENTIAL CONTROLLER
"Built around the summer of 1968, it was designed by an engineer from Cornell, Gene Zumchak, hired specifically because he understood logic circuits, which Bob did not do, being an analog engineer. When it was finished and they were hooking it up to the synth, one of the Moog engineers said, 'Uh-oh, this is going to allow people that can't play to start making music with synthesizers!' And that was on day one of the sequencer!"

921A OSCILLATOR DRIVER
"Connected behind the panel, it controls three 921B oscillators at once, feeding them pitch information at the same time. Chris Swansen, composer-in-residence at Moog, thought three oscillators was the way to go because it matched the three strings on a piano: One oscillator is too thin, two beat against each other, but three creates the lushness you get from a piano. So it's a Moog tradition to group three oscillators together."

CONTROLS TO OSCILLATOR
"Use this if you want to plug a keyboard or ribbon controller into the 921A. It allows your controller to make all three oscillators go up and down at the same time without having to run three connections. So, say I want vibrato—this is a good place to plug in."

911 ENVELOPE GENERATOR
"This was a demand from a customer, Vladimir Ussachevsky of the Columbia-Princeton Electronic Music Center, whom Bob Moog met at an AES convention: 'You have oscillators and voltage-controlled amplifiers. What we need is some kind of device that can create a note shape or a sound shape.' That's when he requested an ADSR type envelope, and he specified what that would be."

921 OSCILLATOR
"An engineer named Bill Hemsath designed a way to keep Moog oscillators in tune, stable, and calibrate them across more than three to five octaves. His improvements led to the creation of the 921-series oscillators, though he was gone from the company by that time."

Original Moog modules, left to right: 921 oscillator, 911 envelope, 902 VCA.

SPECIAL PREVIEW
SEQUENTIAL PROPHET-6

GREATER THAN 5

BY STEPHEN FORTNER

THE PROPHET-6 GOT SO MUCH ATTENTION AT NAMM THIS YEAR THAT THROUGH-out the show, it was hard to get near. Fortunately, designer Dave Smith and *Keyboard* are San Francisco Bay area neighbors, so I dropped by his office for an afternoon of quality time with a late prototype. With its retro Sequential logo and name (which Yamaha recently *gave* back to Smith) the P6 looks like a reissue of the classic Prophet-5, which took the gigging world by storm beginning in 1978, as it was the first portable polyphonic synth with patch memory. But where Moog's new modulars (page 10) and Korg's ARP Odyssey reboot (page 38) go for historical purism, Smith made improvements that would have been either impossible or very expensive in the original's era.

DISCRETE ANALOG

The P6 uses two discrete VCOs (not DCOs), and each of its six voices feeds its own discrete filters—no Curtis chips here. The only digital elements of the signal path are the dual effects (each offering reverb, chorus, phaser, and several delay emulations) but there's a true bypass for those opposed to their analog signal passing through converters.

OSCILLATORS

Continuously variable wave shapes are the big news here, with oscillator 2 able to function as a second LFO if desired. Hard sync is present, and a "Slop" knob can dial in anything from subtle warmth to more drift than an outlaw street racing club.

FILTERS

The P6's lowpass filter takes after the design of the Prophet-5's original four-pole circuit, but to my ears, sounds smoother and less harsh. The P6 then adds a resonant highpass filter, something neither the P5 nor its successor the Prophet-600 had. On either filter, a button ties the depth of modulation by the filter envelope (positive or negative) to key velocity, facilitating some highly expressive playing.

POLY MOD AND AFTERTOUCH

A beloved feature of the Prophet-5, Poly Mod refers to a handful of useful modulation routings. Two knobs set the intensity (positive or negative) of two sources: the filter envelope and oscillator 2. Backlit buttons send these sources to targets: the pitch, waveform, and/or pulse width of oscillator 1, and the cutoff of either or both filters. You can affect multiple targets at once. With oscillator 2 in the audio range and pointed at oscillator 1, the P6 performs FM synthesis. In a similar looking control section, aftertouch can be assigned to either or both oscillators' pitch, LFO depth, amp level, and either or both filter cutoffs.

ARPEGGIATOR/SEQUENCER

The Prophet-5 had neither. The P6's arpeggiator is squarely in Duran Duran territory, but can also act as a sequencer. You enter notes in step fashion (up to 64), using preset tab zero for rests. I whipped up the intro to "Baba O'Riley" in seconds, but the sequencer is good for more than repetitive riffs. "Between the sequencer and the Poly Mod changing oscillator pitch, we had this thing going one night," says Dave Smith, "and we didn't hear it repeat itself for about an hour."

THIS OR A PROPHET '08?

It depends. For an analog poly to put above your stage piano on gigs, the P'08 is cheaper (around $2,000 versus $2,795) and can do splits and layers—while the P6 is technically capable of this, we're told it won't be implemented anytime soon. If it's no-excuse analog you're after—with just the right amount of modern convenience—the P6 absolutely sounds better. Not only that, but the simplicity and immediacy of the menu-less, knob-per-function interface drew me into creating my own sounds from the second I hit the first note. One thing is clear: Unless you're a bona fide collector (or prefer that fifth octave to velocity *and* aftertouch), there's no longer any reason to pay five grand or more for a vintage Prophet-5. The P6 is superior in every way that matters.

All prices are manufacturer's suggested retail (list) unless otherwise noted. Follow keyboardmag.com/gear and @keyboardmag on Twitter for up-to-the-minute gear news.

SPECIAL PREVIEW
MODAL ELECTRONICS 002
THE NEW SUPERSLAB

BY FRANCIS PRÈVE

MODAL ELECTRONICS' 002 IS A-12 VOICE HYBRID SYNTH (DIGITAL OSCILLATORS, analog filter) that incorporates dual NCOs (numerically controlled oscillators), an analog ladder filter with morphing, and modulation resources that go far beyond LFOs and envelopes. The 002 is also has sophisticated multitimbral capabilities and a context-sensitive 4.3" screen that displays very clear and useful graphics. Provided you have $5,200, the synth formerly known as Modulus looks to be a dream machine. We spoke with designer Paul Maddox, who gave us his take on what makes it different.

OSCILLATORS

The 002's two NCOs offer 50 waveforms ranging from virtual analog essentials to wavetable and exotic digital fare. Each oscillator has its own sub-oscillator, which can generate a square wave or a clone of its parent wave. "Digital oscillators' bad reputation has come from poor design and cost cutting," says Paul Maddox. "With the 002 we designed it as if the oscillators were analog. Rather than having one chip generating multiple oscillators, each oscillator has its own processor; this means they're neither perfectly in sync nor in tune, which creates the warmth that has long been missing. We also used a variable sample rate approach, which means our waveforms are the same shape across the entire pitch range; unlike most DSP-based oscillators there's no loss of harmonics as you move up the keyboard."

FILTERS

"The classic transistor ladder filter sounds like nothing else," says Maddox, "but with the number of parts involved in a discrete transistor ladder we knew we'd find it difficult to add more filters of different types. So we 'bent' the ladder by adding a circuit that morphs smoothly from four-pole lowpass through bandpass to one-pole lowpass, remaining fully resonant throughout. We feel this gives 002 the most flexible analog filter in the world. If you want that big four-pole sound but it's dominating a mix, you can roll the slope parameter a little away from pure four-pole, making it fit more smoothly." The 002 also includes two audio inputs for processing external signals through its VCF and VCA.

MODULATION

In addition to envelopes for VCF and VCA, the 002 includes dual LFOs. One operates per voice while the other is global. The 002 then ventures into uncharted territory with the Animator. "The animator is best thought of as a step sequencer for recording knob twists," Maddox explains, "with the principle difference that what starts the sequencer is when you press a note. Each voice of the 002 has its own Animator, each Animator has 12 rows and 32 steps, and each step can have its own length. This means you can modulate up to 12 parameters at once in a very complex, rhythmic way. Destinations can be almost any parameter, so you could be modulating the waveform of oscillator 1, the detuning of oscillator 2, the volume of the sub-oscillators, filter cutoff, and so on, in a fully controllable way." This can all be accessed from the front panel with minimal menu diving.

CONNECTIVITY

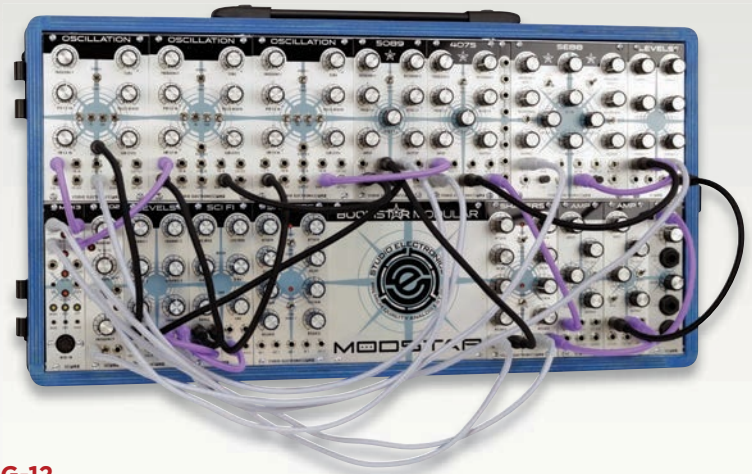
We've become accustomed to soft synths and iOS apps offering cloud-based features, but the Ethernet-equipped 002 is one of the first hardware synths to offer such features as web-based patch sharing and editing. "With most synths, if I want to share just one patch with someone, I have to sysex dump a whole bank and email them the file, and they have to upload and overwrite a bank in their synth," Maddox observes. "Yet with a mobile phone if I want to share a contact with someone I can share just the one, so we wanted to bring that ability to the 002. We also provide an HTML5 editor and the synth itself provides a webpage. Connect your phone, tablet, or computer to you can edit everything. A sound designer could create a patch for a customer a thousand miles away."

See that cloud icon? The 002 includes web-based patch sharing and editor/ librarian features.

MORE NEW ANALOG AND MODULAR

Synths

BY GINO ROBAIR



STUDIO ELECTRONICS MODSTAR SENSEI

WHAT Three-oscillator modular featuring three classic filter designs: Moog-style lowpass, ARP 2600-style lowpass, and Yamaha CS-80 multimode resonant filters. Includes MIDI interface, four-stage envelope, mixer, LFO, two VCAs, and room to expand. **WHY** The outstanding analog sound of the Boomstar synths in an expandable Eurorack format. **$4,649 | studioelectronics.com**

ANALOGUE SOLUTIONS NYBORG-12

WHAT Analog synth voice with two oscillators and EGs, sub-oscillator, LFO, MIDI-to-CV, a multimode Telemark-style two-pole filter, noise, sample-and-hold, VCA, and mixer. Multiple Nyborg-12 modules can be connected and played polyphonically. **WHY** Because you want a large-format synthesizer with big controls and an even bigger sound. **£599 | U.S. price TBD | analoguesolutions.org.uk**

TEENAGE ENGINEERING/ CHEAP MONDAY POCKET OPERATORS

WHAT Three calculator-sized synths: PO-14 Sub bass synth and PO-16 Factory melody instrument (with arpeggiator, sequencer, and chord player) offer FM, subtractive, wavetable, and physical modeling synthesis; the PO-12 Rhythm is a drum sample player with 16-step sequencer and effects. **WHY** At this price, resistance is futile! **$59 each | teenageengineering.com**

BLACET RESEARCH PUMA 15

WHAT A complete synth voice—VCO, VCF, VCA, EG, and LFO—in Frac Rack modular format, featuring a MIDI-to-CV interface (with arpeggiator, clock divider and additional LFO), digital effects, a mixer/voltage source, and empty slots for expansion. **WHY** It's a great sounding system in a DIY-friendly format. **$1,450 | blacet.com**

WALDORF NW1

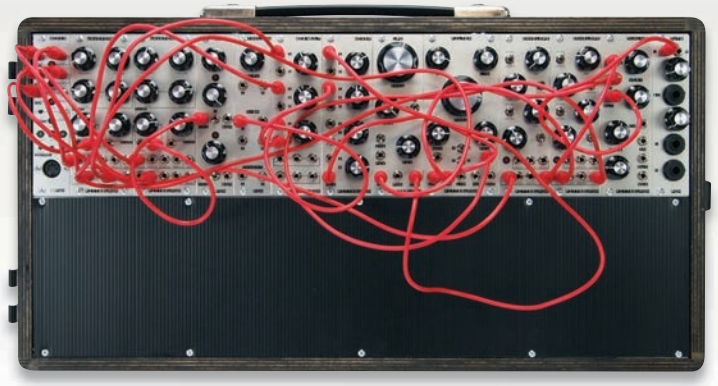
WHAT Eurorack module featuring MicroWave and PPG wavetables with independent control over the spectral envelope; built-in speech synthesizer and support for user-recorded wavetables. **WHY** All the features you loved about Nave for the iPad are now in hardware under voltage control. **€329 | U.S. price TBD | waldorf-music.info**

VERBOS ELECTRONICS PERFORMANCE SYSTEM

WHAT Based around a 32-note pressure-sensitive touchplate keyboard with eight tunable capacitive pads, this instrument includes the Buchla-inspired Complex Oscillator, the unique Harmonic Oscillator, the multistage voltage source, and a combination VCA and Vactrol-based lowpass filter. **WHY** It provides unique and incredibly subtle performance capabilities. **$3,199 | verboselectronics.com**

PITTSBURGH MODULAR FOUNDATION 3.1+

WHAT Dual-oscillator Eurorack synth with triple-mode MIDI module (monophonic, duophonic, and arpeggiator), multimode filter, lowpass gate, two EGs and VCAs, mixer, noise, and sample-and hold. **WHY** It's a keyboard-ready modular starter system that offers two-voice capability and leaves 3U of space open for expansion. **$2,249 | pittsburghmodular.com**



THE HARVESTMAN IRON CURTAIN

WHAT Eurorack modular based on the Polivoks, a Soviet-era analog keyboard synth featuring a two-pole resonant filter (with lowpass and bandpass outputs), two sawtooth-core oscillators, and a sub-octave divider, all made from new-old-stock parts. **WHY** For a synth voice with attitude, look no further, comrade. **$2,000 | theharvestman.org**

BUCHLA LEM-SERIES SYSTEMS

What Half-sized 200h-series modules configured into desktop-friendly powered racks, including MIDI-to-CV and CV-to-MIDI interfaces, a multi-connector utility module, a dual function generator, and a dual lowpass gate. **WHY** They're a cost-effective way to integrate Buchla 200-series modules into your MIDI or Eurorack systems. **$899 - $3,499 | buchla.com**

MAKENOISE SHARED SYSTEM

(black-and-gold edition with CV bus)
WHAT Take an analog dual-VCO, dual lowpass gate, and VCA/ring mod, throw in an entropy generator and CV-controllable effects, then put the entire system under the control of a non-linear Cartesian-style sequencer. **WHY** It erases the line between music generation and sound design. **$4,500 | makenoisemusic.com**

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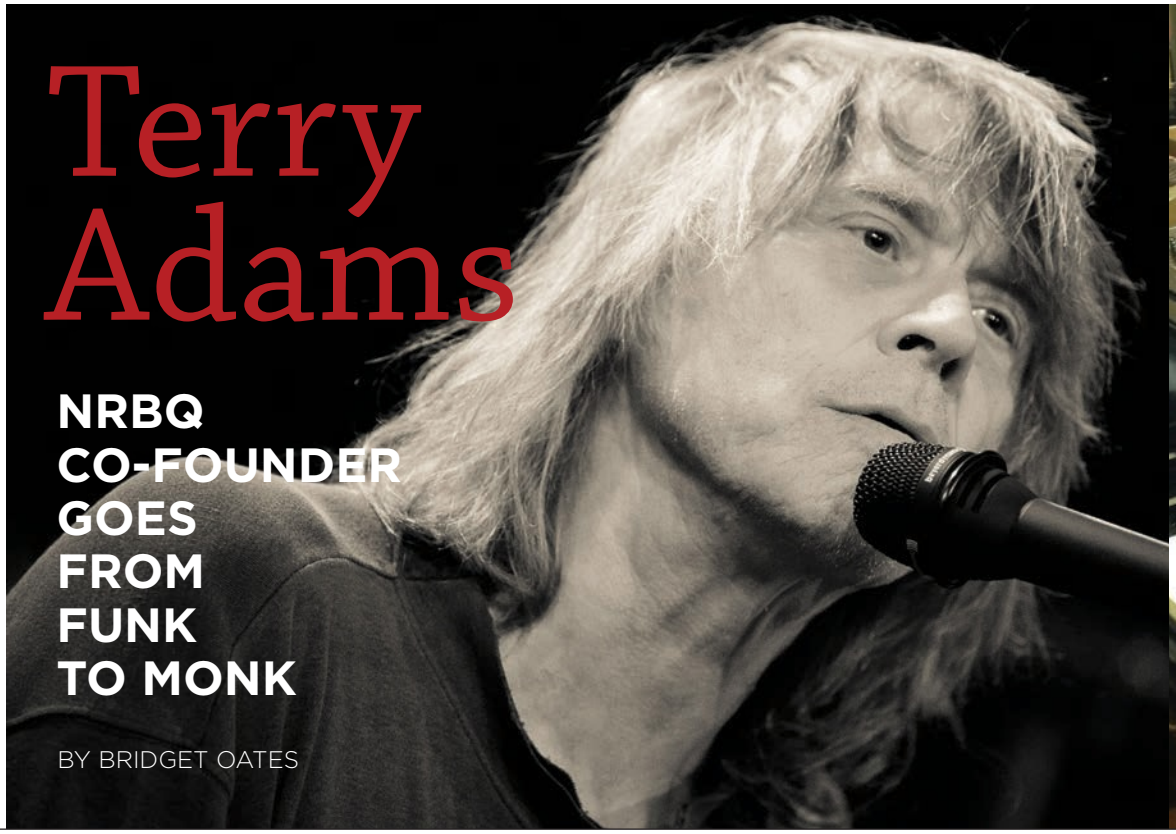
Terry Adams

NRBQ CO-FOUNDER GOES FROM FUNK TO MONK

BY BRIDGET OATES



TERRY ADAMS IS THE ELECTRIFYING PIANIST IN NRBQ, THE BAND HE CO-FOUNDED with a his guitarist friend Steve Ferguson in 1965. The New Rhythm and Blues Quartet was initially a Quintet. They became a seven-piece band with Joey Spampinato (bass), Tom Slaley (drums), Frank Gadler (vocals), and a horn section that would later become the Whole Wheat Horns featuring Keith Spring (sax), and Donn Adams (Terry's brother, trombone). In every configuration, the group's easygoing, eclectic mix of rockabilly, exploratory jazz, R&B, and Brit pop—sprinkled with dozens of playful, charming nuances—whipped up a loyal cult following.

They also attracted numerous celebrity fans, including Elvis Costello, Keith Richards, Paul McCartney, and Dave Edmunds, who enjoyed their high-energy live shows. John Sebastian from the Lovin' Spoonful is an honorary member, and they've collaborated with Bonnie Raitt and members of Sun Ra's Arkestra as well.

Another claim to fame: NRBQ's playful nature caught the interest of Mike Scully, head writer and executive producer *for The Simpsons*, and he wrote them into the episode "Take My Wife, Sleaze" in 1999. The band appeared in animated form in a biker bar and on camera during the end credits, playing the show's theme song.

This year, NRBQ is gearing up to record a new album and celebrate their 50th anniversary. To mark the occasion, the band will put out several archival releases. And on top of enjoying the group's golden milestone, Adams is putting the finishing touches on what he calls a "lifelong project," dedicated to the man who inspired him greatly at an early age, Thelonious Monk. Adams' Monk tribute, *Talk Thelonious*, will be available this fall.

Adams became a fan of the jazz master at 14, and first saw him in concert on his 15th birthday. "I learned a lot from listening and being around him," says Adams. "I used to drive to New York City from Louisville alone as many times as I could when he was playing," recalls Adams. "I wanted to be near the masters, and I met Sun Ra, John Cage, and Moondog, as well. At a Thelonious Monk show, the [jazz patroness and journalist] Baroness Pannonica de Koenigswarter said, 'I see you here a lot.' I told her I'd be there every night if I could and she said, 'Well, from now on, you're our guest.' I wound up being on their guest list. After he died, I had all this in me and didn't know how it was going to come out."

Monk's unique improvisations and orchestrations inspired Adams to be confident in his own ideas. "His music gives you strength to be yourself and stay yourself. I don't care what it takes; if I have a song in my life, it has to be sung and it can't be messed with by copping out for this reason or that. When musicians like him set the example, I respect that," Adams says.

Adams had played Monk's music on and off in bits and pieces for years when producer Don Sheldon asked him to do a Monk-only show. Sheldon produced Adams' 2014 Flynn Center show in Vermont, and the 12-song *Talk Thelonious* album will largely consist of the live recording.

"I wanted to arrange and play it my own way without compromising the original intent," says Adams. "My arrangements hold true to Monk's compositions, with the right notes and what each song means, yet each song is a different arrangement with different instrumentation," says Adams. He played and recorded the complex pieces with members of NRBQ, including Scott Ligon (guitar), Casey McDonough (electric bass), and Conrad Choucroun (drums). Also performing on the album were Pete Donnelly (electric bass), Jim Hoke (alto saxophone, pedal steel guitar, and chromatic harmonica), Klem Klimek (alto and

tenor saxophone), and Pete Toigo (bass).

"I didn't want to make a jazz record of his music," says Adams. "I could never do it. With music like that, I felt like it was a mountain that was hard to get to around or over, but finally being able to go through it instead was the answer.

"The challenge for years has been how to apply the music to myself," he continues. "It's music that really can't be imitated. You have to get your own self in there with such a personalized, complicated music. It's about what kind of place it's in rather than just playing jazz as we know it. It's figuring out the feel of the piece, which is how I write music anyway. I get a groove, rhythm, or tempo, or three or four bars that keep going around in my head and it can turn into a finished song. Once the spirit or the feel is there, it can't be changed."

Adams' unrestrained energy is a trademark of his performances. He throws his whole body into his songs, sometimes pounding the keys with his palms or fists, and stomping his feet throughout. It's an approach that dates to his earliest days as a piano student, when he remembers taking a jazz lesson from a well-known teacher. "I was feeling pretty good, when he stopped me mid-song and told me I had to stop stomping my feet and that I should tap my toe inside my shoe instead," Adams says. "I left and never went back."

"I've never approached music in any kind of way that already existed," he says. "I think it's a problem that there's some kind of mold of what a certain type of music is, and then young musicians try to be that. That's already been done."

Adams then changed his focus from jazz to composition and theory. "I skipped piano lessons and went right there. I wanted to know all the possibilities of the 12 notes we usually work with. I told my teacher I wanted to make other people feel the way that I feel when I hear music. He told me to write a song and come back and play it," says Adams, who is seeing his earliest achievements come full circle as NRBQ turns 50: A song he composed at age 15, "The Places Far Away," is featured on NRBQ's latest album, *Brass Tacks*.

Not one to be restrained in any way, the creative keyboardist defies genre categories onstage as well. " I'm never happy with a performance unless something happens that we didn't expect," he says. "You have to fall into the unknown. I don't like to know what's going to happen. I like to experience chance and go with the mistakes. When you hear something unexpected, that's where the magic starts happening."

TERRY ADAMS ON TOUR

For all of NRBQ's live dates in the U.S. and Canada through 2004, Adams' faithful companion was a Yamaha grand piano, and he and the band's techs learned a great deal about keeping a piano tuned and getting great sounds on the road:

"I had tuners everywhere we went around the U.S. They loved me for the work, but they would also go, 'God! What has he done to this thing?'" Adams laughs. "In extreme winter weather, it would stay out in the truck overnight and then be brought it into a performance space and warm up. There was constant maintenance, but we were able to play in any kind of conditions. The only time we had tuning problems was playing in the north and then traveling south, playing in New Orleans or Florida. Everything would go crazy on the strings. It was hard to keep that right.

"We replaced the strings every other town and it was tuned every night," says Adams. "I had some Helpinstill pickups; three of them covered all 88 notes. It was the best way to amplify a piano that I ever found. A microphone never worked, especially at the volume that we were playing. The microphones would just pick up bass frequencies and sound kind of roomy or boxy, but these pickups allowed me to play a grand piano in a rock 'n' roll band," he says.

Adams has tried using a digital piano on the road but found it restricting. "My piano lets me smear or finger-paint, where a digital piano doesn't understand that. It wants to know detailed information. The acoustic grand is saying, 'Whatever it is, go with it,' where the digital says, 'What note do you want, sir?'"

Adams also had members of the road crew assigned to keeping his Clavinet in shape and tuned nightly. "The Clavinet is great. I just play it through a Fender Twin amp and let it go," he says, adding that the only drawback is the lack of sustain. "I've loved being part of a great rhythm section and the clavinet has been good for that. Because of the Clavinet, NRBQ sounds like a two-guitar band a lot of the time."

Studio Electronics

DON'T CALL IT A COMEBACK

BY DAVID BRYCE

"ANALOG RENAISSANCE"? FOR OVER 30 YEARS, STUDIO ELECTRONICS HAS simply never stopped making high-end analog instruments, no matter how dominant FM- and sample-based synthesis became for a time. With so many larger brands now synonymous with the analog craze, we thought it time to catch up with principals Greg St. Regis and Tim Caswell, who just might be the most unsung heroes in the synth business. Read more at keyboardmag.com/may2015.

Tell us how the company got started.

Greg St. Regis: All of us at one time ended up working at SIR [Studio Instrument Rentals, a leading backline rental service] because we were all failed musicians. I think we got to L.A. in '82, and then my dad ended up working there. He started to do electronics as part of SIR. Tim could fix anything at that point. So they started Studio Electronics, and it was like a retail repair unit within SIR. That's why it's called *Studio* Electronics—because it was inside Studio Instrument Rentals.

Tim Caswell: For me, the best part was being surrounded by all these cool, expensive synths I wouldn't have had access to otherwise.

GSR: Around '84 to '86, I think, Tim was doing MIDI upgrades for [Yamaha] DX7 synths, such as memory expansions. He started MIDI'ing Minimoogs inside the chassis around that time. Then, racking stuff was just sort of a natural thing. People brought us Oberheim SEMs, Prophet-5s, OB-8s . . . we stuck those in a rack.

How did you go from doing mods to making your first synth, the SE-1?

GSR: We wanted to do something on our own, something programmable. We wanted to explore our own creativity. It was Tim's concept for what features it was going to have as far as four envelopes, three LFOs, and so on. I hadn't quite gotten into the product design. I was still just sort of building the stuff. It was after the SE-1 that I got more into it. So that Tim's panel layout, and his concept for what we would do.

So, the SE-1 wasn't trying to go for any one sound?

GSR: Right. We put in a Moog filter *and* an SEM filter and said ,"Oh, that's cool! Flexible!" Then we just sort of built something around it. The SE-1 led to the ATC because we wanted to make something less expensive. After that, we wanted something polyphonic. So we did the Omega, which was really a combination of an SE-1 and an ATC voice board.

When digital synths became the rage starting in the mid-'80s, was there ever a time when you questioned your focus or your business model?

GSR: No, because there was no business model. We just liked the sound of analog. We had enough clients that liked the sound of analog. And since we didn't have any other places that would hire us, we just did what we did.

TC: We've never paid any attention to trends. We just stuck to the stuff that we ourselves find interesting.

The Eurorack market is saturated with synth modules at this point. How do you feel about entering it?

GSR: It's super fun. It's for a different kind of musician. It's not a guy who's playing scales every day. It's a guy that's plugging patch cords. I'm not saying that there aren't really good musicians out there that use modulars—there's a lot of talent out there. But it's a crowded field, and it's intimidating. There's some really clever stuff on the market. So we've learned that you just have to do what you do best, and what we do best is what we've been doing: making these really nice, high-quality circuits. We've battled with crosstalk and bleed and stuff like that, but when you break [a synth] down into its individual elements, it's perfect. ♫

MIDIMOOG
An early rackmount of an actual Minimoog, with MIDI and other mods added.

HARVEY 808
Roland's now coveted TR-808 drum machine gets the rack treatment.

SE-1
The Minimoog on steroids that owned hip-hop.

ATC-1
This affordable variant on the SE-1 introduced swappable filter cartridges.

OMEGA 8
Eight-voice discrete analog poly in a rack.

BOOMSTARS
Desktop monosynths with different filter flavors.

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Edgar Froese

BY STEPHEN FORTNER

RALF ROLETSCHEK

WE WERE IN THE MIDDLE OF NAMM when we got the sad news that Edgar Froese, co-founder of seminal electronic music group Tangerine Dream, passed away on January 20 of this year at age 70. We leave you with two of his observations from previous *Keyboard* interviews that are just as relevant to making music with technology today as they were then.

"There shouldn't be the necessity of having to be very popular in order to get away with doing something different. It's amazing to me to come to the United States and hear what is being played on your radio stations. It's all rock music, ads, soft music, ads, pop music, ads. . . . It's so funny, because all the hardware one could ever want is available in the States and yet no one seems to be making use of it to do anything different." —APRIL 1981

"In our music we tried to turn everything upside down. . . . We thought a 4/4 beat should not necessarily be a 4/4 anymore. We found that the mixture between *C* major and *F* sharp minor chords and melodies, which normally never fit, suddenly did fit. Once you lose the connection to conventional structures, you find a new structure within your own subjective philosophy. Suddenly you have a new reality, and that's wonderful." —JANUARY 1986

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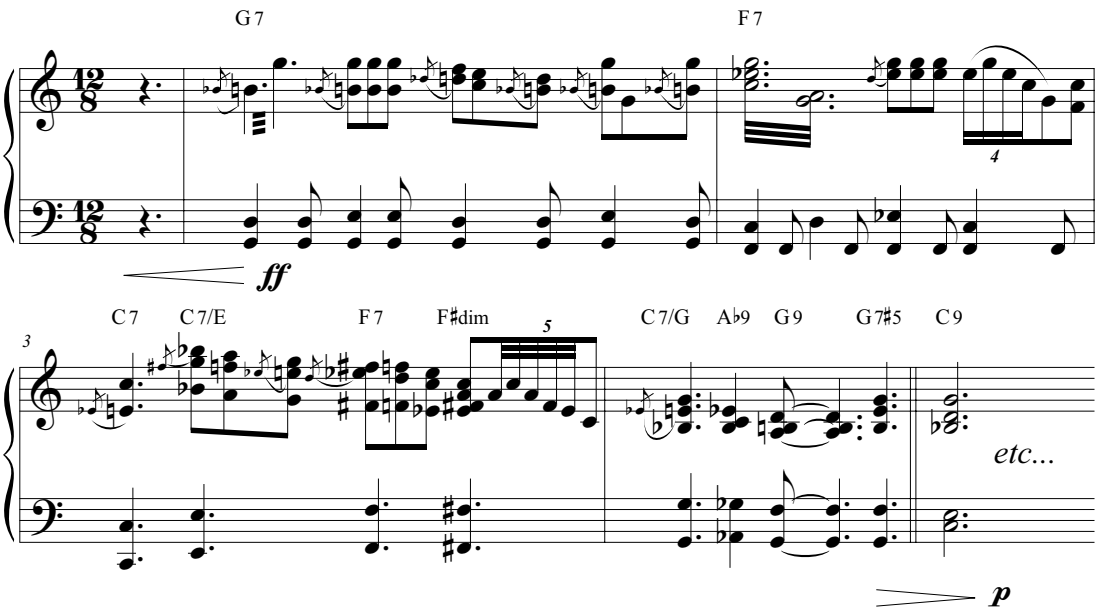
TRADITIONAL Slow Blues

BY SCOTT HEALY

PLAYING A TRADITIONAL, SLOW, CHICAGO-STYLE, 12-BAR BLUES TUNE CAN BE A REAL CHALLENGE FOR A PIANIST. Doing so involves many duties: laying down a groove, establishing proper harmony, and creating excitement, all while restraining yourself to a simple chord progression and a five- or six-note scale. With traditional blues, the only strict rule is there are no rules, only traditions. So let's look at some of them.

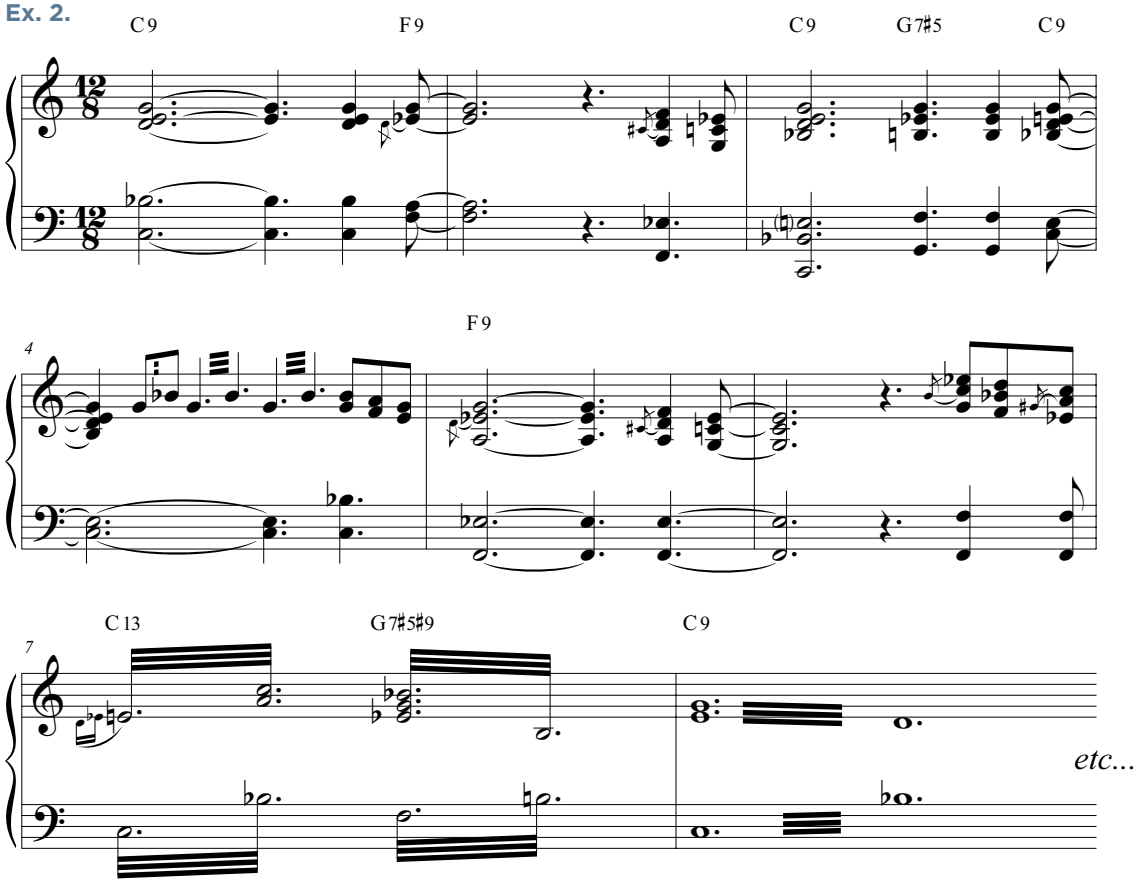
Ex. 1.

1. Starting from the Five

Ex. 1 demonstrates how sometimes you'll be starting the blues with a loud guitar or drum pickup into the last four bars of the progression, *a la* "Key of *C*, from the five! . . . two, three, four..." At that point, you start right on the *V* chord, so come in strong with both hands. In this scenario, the entire rhythm section is setting up the time, the groove and the harmony with the "walk-down" chords (*V7-IV7-I7*) and the subsequent turnaround (*V7♯5-I7*).

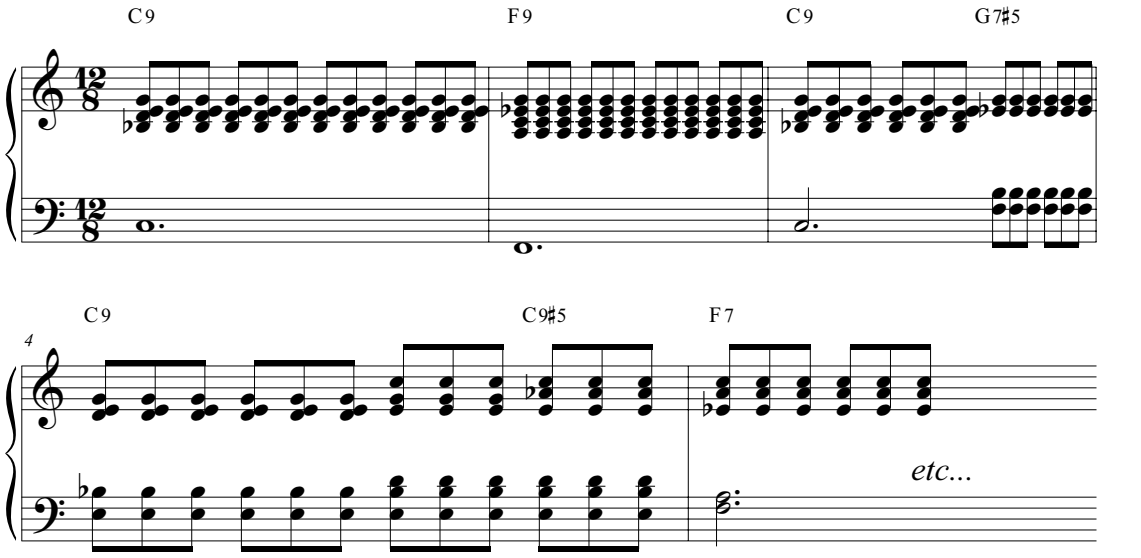
Practice Tip

"With traditional blues, you need to know how to evoke the proper blues style and mood, which is both deceptively simple and chock full of controlled chaos," says Grammy-nominated keyboardist and composer **Scott Healy**. Healy has performed and recorded with Tony Bennett, B.B. King, Bruce Springsteen, and Christina Aguilera, as well as Chicago blues legends Hubert Sumlin and Son Seals. He's also the longtime and current keyboardist for TV's Conan O'Brien. Healy's acclaimed new album *Live at Kilbourn Hall* is out now. Find out more at bluedogmusic.com.

Ex. 2.



Ex. 3.



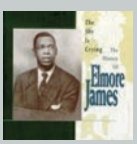
2. Slower Than Slow

A traditional slow blues can be *really* slow, as illustrated in **Ex. 2**. In this scenario, the singer might cut the band on the downbeat, and break things down to a really soft first chorus of solo or vocals. Now the band's suddenly playing very softly and your part is exposed. In this situation, open chords work great. Spice them up with a few fills, tremolos, slip notes, or hammers, which are basically on-the-beat grace notes. If you've grown up listening to rock and blues, these licks might already be in your DNA; it's just a matter of activating them and playing them tastily. In this example, I'm moving to a "quick four," which is a *IV* chord on the second measure. Then I'm back to the *I7 chord* in the third, and then to a *V7#5* to a *I7* in the third to fourth bar. Whatever you do, you *must* watch the singer, listen to the drummer, and listen to the vocal phrasing. You can play a tasty fill in the space between lines. So too might the guitarist. In my experience, some of the authentic stone-cold blues players want you to fill and solo with them at the same time.

3. Triplets and Shell Voicings

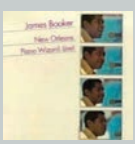
You might want to build on a 12/8 feel by playing triplets in the right hand, as seen in **Ex. 3**. For the left hand, you can choose to play nothing at all, roots by themselves, third and seventh "shell" voicings, or even tenth voicings if you can reach. It's also cool to open the voicings up, spreading the notes between both hands. Whatever voicings you use, remember to listen to the drummer and put everything right "in the pocket."

Listening List TRADITIONAL BLUES

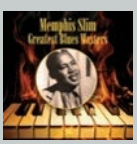


ELMORE JAMES
(Johnny Jones, piano)
"The Sky is Crying,"
The Sky is Crying

OTIS SPANN
"Country Boy Blues,"
Blues Legends and Journeymen

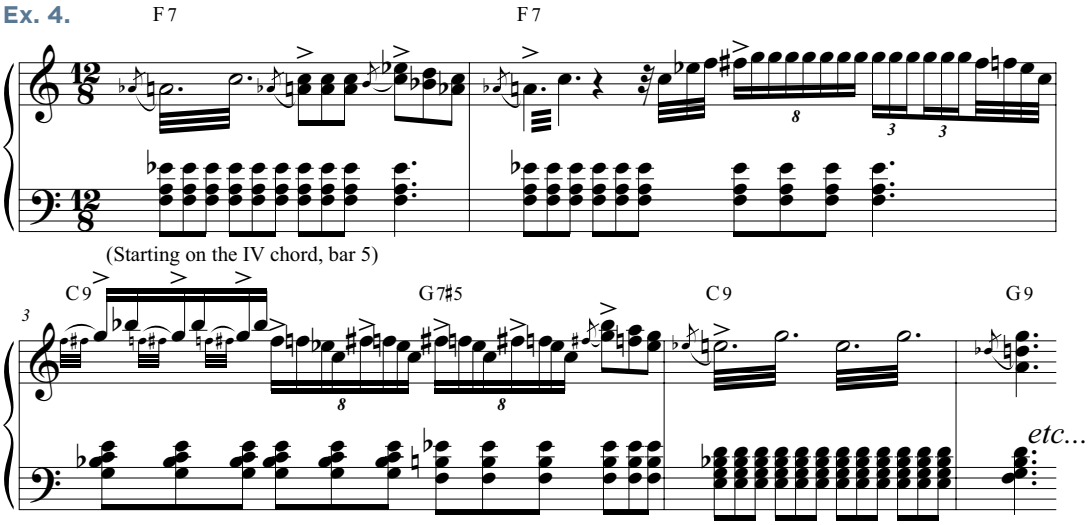
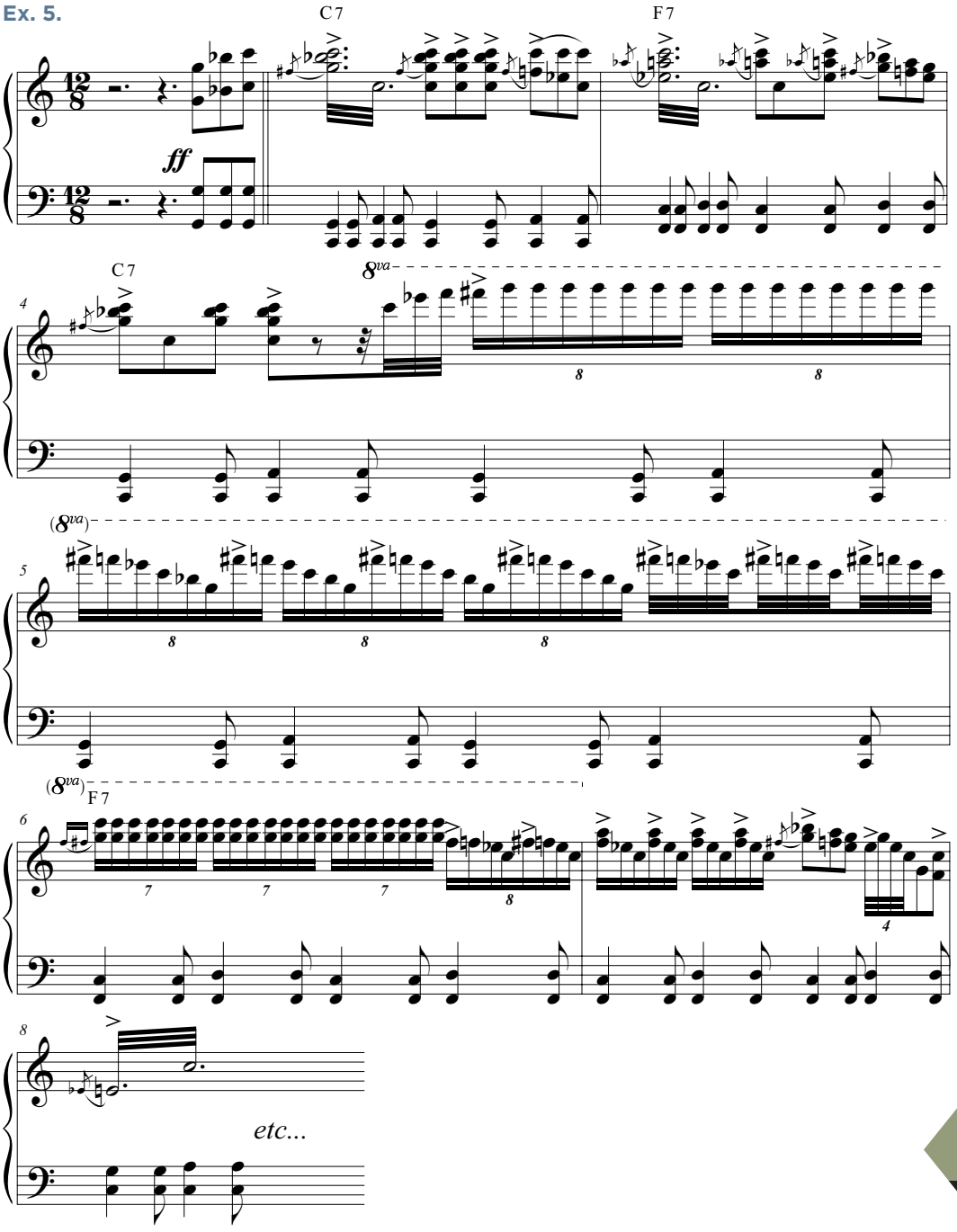


JAMES BOOKER
"Black Night,"
New Orleans Piano Legend: Live



MEMPHIS SLIM
"Blue and Lonesome,"
Great Blues Masters

HUBERT SUMLIN
(Scott Healy, piano)
"Gonna Move,"
Wake Up Call

Ex. 4.

Ex. 5.

4. Tremolos and Slippery Licks

When you want to kick things up a notch, try playing close voicings or even triplets in the left hand, and tremolo riffs and cool slippery licks in the right hand, as in **Ex. 4**. Full rhythmic coordination of both hands will take a while to get used to, because so many blues licks are out of time. But no matter what you do in your left hand, don't comp like you're playing jazz. Play strong, because you might be the only rhythm instrument playing the chords.

5. Rocking Solo Riffs

During the last chorus of a solo, the whole band should open up and really rock, as illustrated in **Ex. 5**. This is your time to hook up with the bass player, drummer, and hopefully the guitarist, too. Play the boogie/rock left-hand pattern, and in the right hand you can riff loudly and frenetically in a high register. Out-of-time, four-finger repeated riffs work great, as do traditional rock and New Orleans-style riffs. ♫

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Hear Scott play the audio examples from this lesson.

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All About That Fake

IMITATING REAL INSTRUMENTS ON KEYS

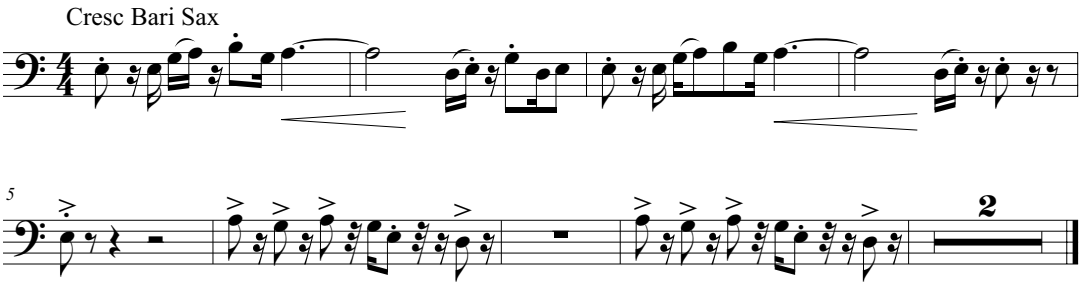
BY DAVID BARON

SOME MONTHS AGO, MY PRODUCER FRIEND KEVIN KADISH CALLED ME UP from Nashville, Tennessee and told me he wrote a tune with a young songwriter named Meghan Trainor. Kevin had the vocals, guitar, and drums fleshed out, so he sent me a Pro Tools file and I told him I would "play what I heard" on it. My involvement with the now worldwide hit "All About That Bass" started there. Kevin and I played all the instruments on the song, including real Yamaha upright piano and Hammond C-3 organ.

Now for the simulated parts. I heard a baritone sax part in my mind but had no budget to hire a real sax player, as Meghan was still unsigned at that time. I fired up Native Instruments Kontakt and loaded a very old sax sample originally from a mid-1990s CD-ROM. Samples don't always have to be the latest and largest to work well. In fact, I played that same sample on Lenny Kravitz's "Lady," a single that went Gold. The lesson: Take the time to explore your sample libraries deeply. Let's look at some more ways to fake instruments well.

Compare and Contrast

"When faking instruments on keyboards, always listen and analyze your choices at every opportunity. A/B your options, and never settle," says New York-based keyboardist, composer, and producer **David Baron**. Baron's work appears on new albums by Lenny Kravitz and Meghan Trainor. Baron is currently scoring the feature film *Ashes and Snow* for Gregory Colbert, and he teaches audio production and film scoring at Bennington College in Vermont. Visit him at edisonmusiccorp.com.

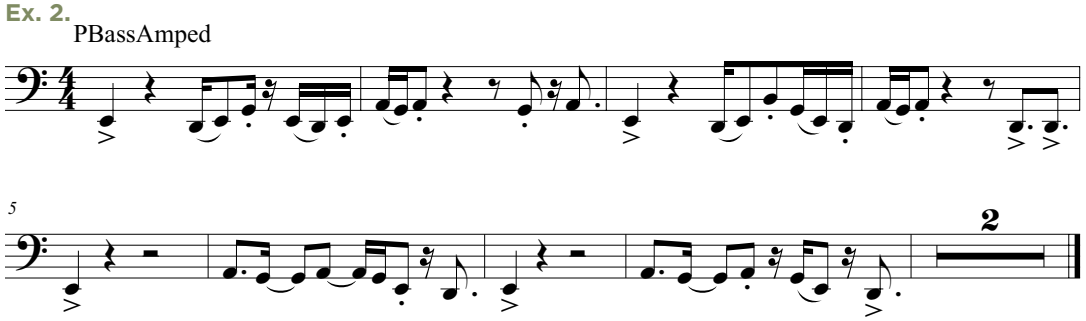
Ex. 1.

1. Baritone Sax

The key to playing a convincing baritone sax sample is arranging an appropriate part, like the one in **Ex. 1**. What does a bari sax usually play? Is the tonality correct for the genre? The sample set I like has an appropriate growl for 1950s-'60s rock 'n' roll. The sound starts with a short hit, followed by a crescendo. I played the part with a combination of short notes and long swells, the way a real saxophonist would play it. I didn't quantize it. You can hear the mixing up of articulation, which contributes to the part's human quality. In combination with other instruments, a part like this can sound very real.

SOUNDCLOUD

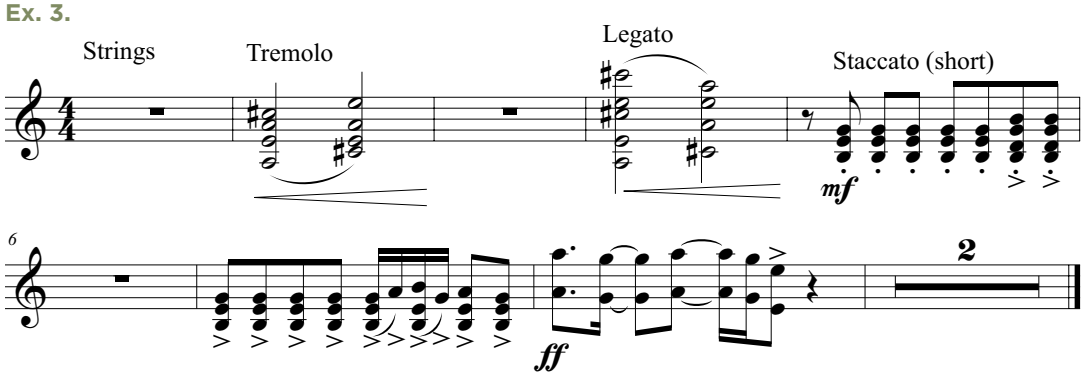
Original audio examples.

keyboardmag.com/may2015

Ex. 2.

2. Bass Guitar

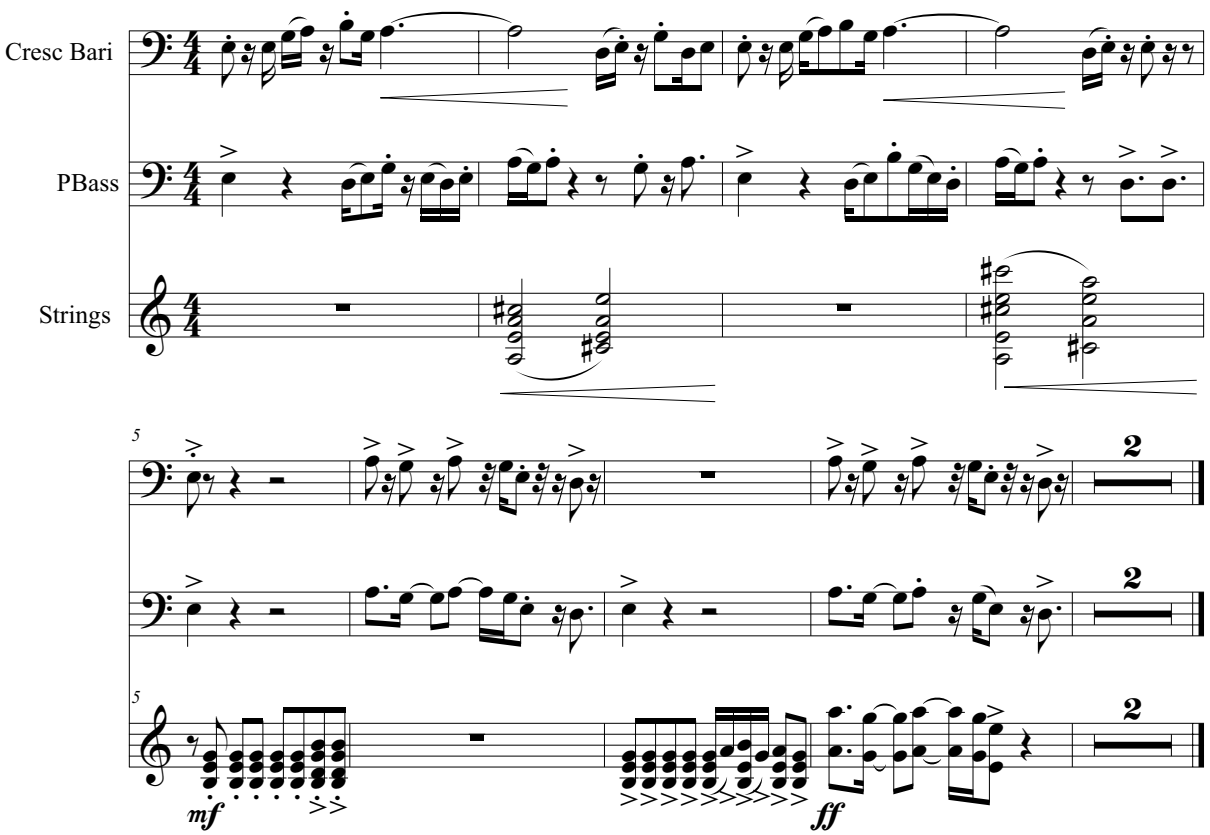
Instrument samples are now so good that you can fool almost anyone. Why, then, do some keyboard-played parts sound real and some sound fake? Again, it comes down matching the right part to an appropriate sound. Think like you *are* a bass guitarist. Which instrument would you choose? An active or passive electric bass? Dirty or clean? Pick or fingers? Make all your choices based on the genre of the song. Play root notes followed by rhythmic passages that allow the lead vocal or other lead instrument to breathe. Try not to simply mimic a kick drum pattern, unless you're going for a robotic feel. Combine long and short notes into convincing phrasing. I tend not to quantize bass parts, but I will frequently line up certain hits with the kick drum, yielding a tighter feel. I also frequently *delay* my bass parts 10ms or so back after I have played them. **Ex. 2** demonstrates such a simulated bass part.

Ex. 3.



3. String Section

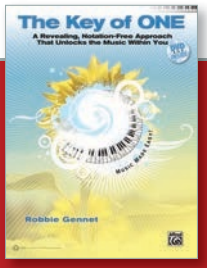
Ex. 3 illustrates a short, simulated string part. There are a lot of fantastic sampled string libraries on the market, but my biggest issue with these in pop music is that the many of them are often so large (both sonically and memory-wise) as to be appropriate only for film scores. They sound amazing by themselves, but they can turn into mush against pop instrumentation. When faking strings, again I think like an arranger, *e.g.*, what is the appropriate number of virtual string players in the section? Sometimes the only musical space left in the track is high above the vocal. Explore your sample sets, and not just the typical long and short variations. *Sordino* (muted) strings are fantastic for quiet textures. Swells are great to lift you into a section. Tremolo can add excitement. I frequently do a ton of volume automation on string passages. If you play strings statically like an organ, they'll sound like an organ, so use your controllers and key-switches!

Ex. 4.

4. All Together

Ex. 4 illustrates how the above three sounds might be combined in arrangement where no one sound "steps on" any of the others. ♫

Demystifying the Modes

BY ROBBIE GENNET



Robbie Gennet is a touring keyboardist, guitarist, longtime *Keyboard* contributor, and educator at Musicians' Institute in Hollywood, California. His book, *The Key of One* (Alfred Music) outlines a thorough method for understanding music without learning traditional notation. You can get it at alfredmusic.com, and take private lessons from Robbie at thekeyofone.com.

TO MOST BEGINNING STUDENTS, THE WORD "MODES" SOUNDS INTIMIDATING— not unlike the word "theory." But much like we found our basic theory to be much simpler than we thought, the same applies to the modes.

The basic seven modes—Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, and Locrian—come from the major scale formula. They're a by-product of playing the notes of any given major scale starting on any number other than the 1. So if you were in that particular note's key, you would be playing a mode. In the grand tradition of giving things multiple names to confuse us, two of the modes simply are the major and minor scales: the Ionian and Aeolian, respectively. That leaves five modes and four of them are only one note different than the formula for a major or minor scale. Here's the breakdown:

- Dorian: minor scale with a major sixth.
- Phrygian: minor scale with a ♭2.
- Lydian: major scale with a ♯4.
- Mixolydian: major scale with a minor seventh.

The final mode, Locrian, differs from a minor scale by just two notes: the ♭2 and the ♭5. All told, the modes "justify" using a ♭2, ♭5, and major sixth in a minor scale and the ♯4 and minor seventh in a major scale. If you use these single substitutions every time, you're playing modally. When you look at the modes this way, they're much simpler to conceptualize and use in your playing. Your comfort with the sounds of the numbers will help infuse your note choices with intention as you play, because in the end, every note is somehow justifiable by *context*. Like spoken or written language, musical language is meant to be adaptive and flexible.

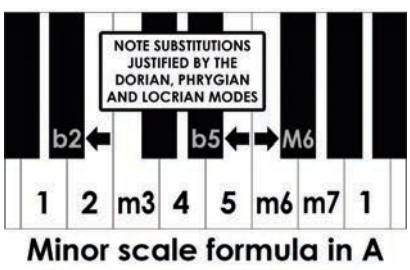
In order to practice the modes, simply make the above substitutions in every key. Since *C* major gives you the modes right on the white keys, it's the easiest place to start playing modally. To play Dorian, play a *D* bass note (I like to play an octave to reinforce that tonally) in your left hand and play up the white keys with your right, starting on *D*. It's the *D* minor scale but notice the sound of the major sixth and the difference it makes. For Phrygian, move to an *E* octave in the left hand and play up the white keys in the right. Listen to the way the ♭2 sounds in the *E* minor scale. An *F* octave in the left hand will turn the white keys into the Lydian mode and suddenly your *F* major scale has a ♯4 in it. Move up to a *G* octave in the left hand and the white keys give you the Mixolydian mode: a *G* major scale but with a minor seventh, which sounds kind of bluesy.

We can skip Aeolian for now, as we're hopefully already familiar with the minor scale. Lastly the Locrian mode can be heard with a *B* octave in the left hand and the white notes in the right. You can hear the ♭2 and ♭5 and they sound distinct in the *B* minor scale. Don't just learn what we've gone over here; learn the substitutions based on transposing to all 12 keys.

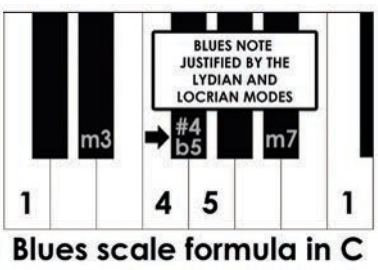
Other modes and scales were invented along the way, and they're also closely related to our major/minor scale formula. Plus, they also justify note substitutions. Two common examples are the harmonic minor and harmonic major scales. The harmonic minor simply uses a major seventh in a minor scale, while the harmonic major uses a minor sixth in a major scale. Much like we saw with the basic modes, if you play those note substitutions every time, you'll be playing in those alternate scales. However, you can also use those justified substitutions on demand to color your melodies while writing or improvising.

There's one note that's justified for both the major and minor scales: the ♭5 (or ♯4) between *4* and *5*. That note is not used in the major or minor scale, but it is used in the blues scale, and is in fact the main reason the blues scale fits over major and minor chord progressions alike. Much of its justification comes from its appearance in the Lydian and Locrian modes. Remember, every note can be justified in one way or another, and improvisation is just creating that justifying context in real time.

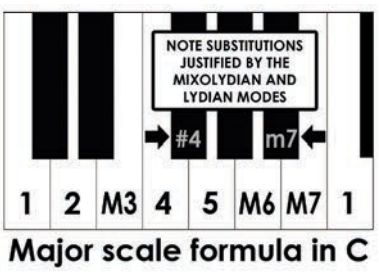
Practice these modes while consciously speaking or singing the numbers of the notes out loud to reaffirm them in your mind. You can also play modally and then switch back from the substitution to hear the difference between the mode and the scale it's close to. Your understanding of this is important, as is the ability of your fingers to move dexterously on the keys. But it's your ears' ability to "hear those numbers" that will help your brain learn to interpret and apply them. ♫



Minor scale formula in A



Blues scale formula in C



Major scale formula in C

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THE ART OF SYNTH SOLOING

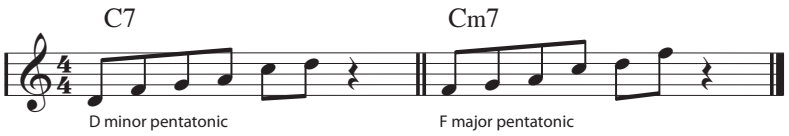
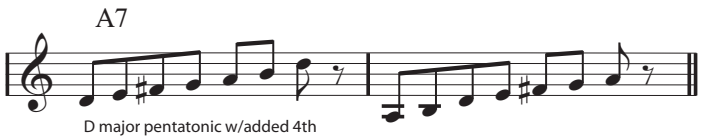
Jan Hammer: The Notes

BY JERRY KOVARSKY

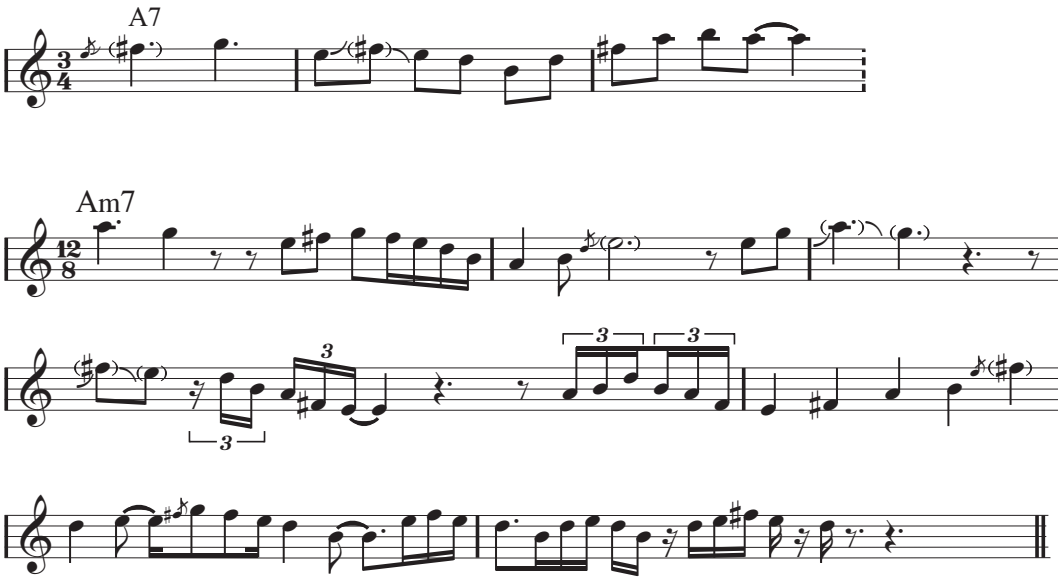
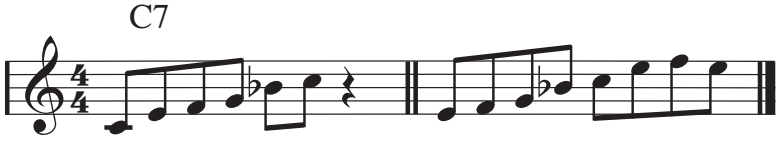
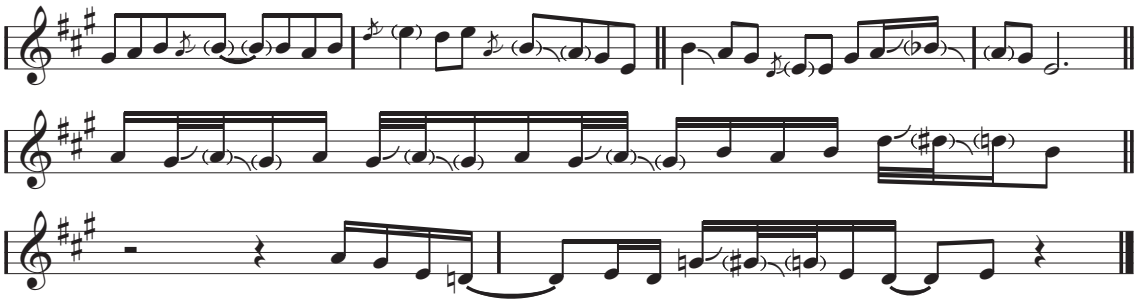
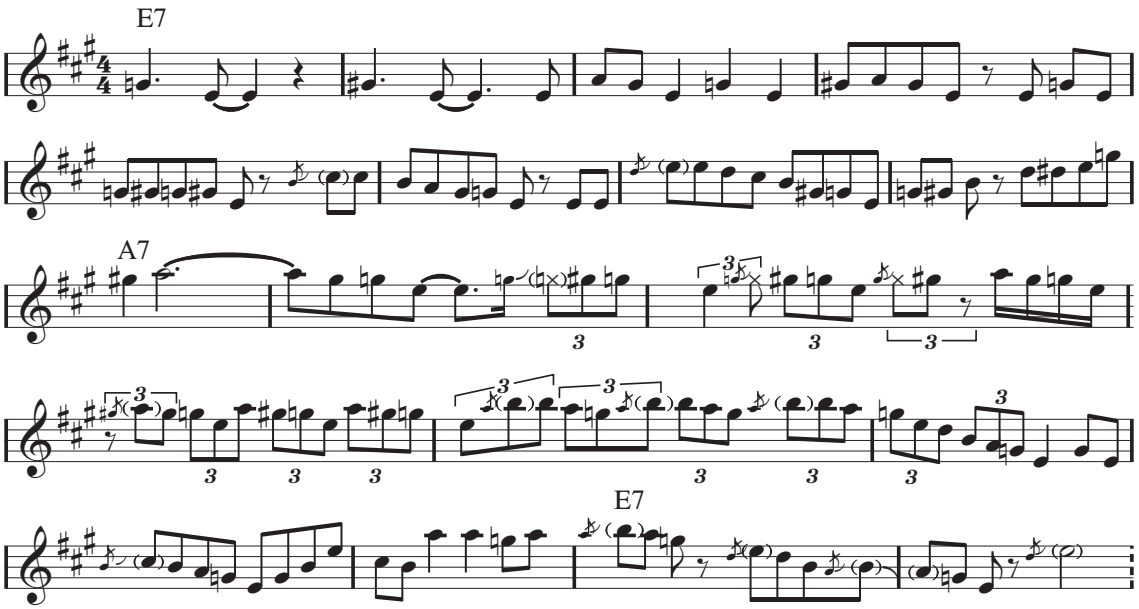
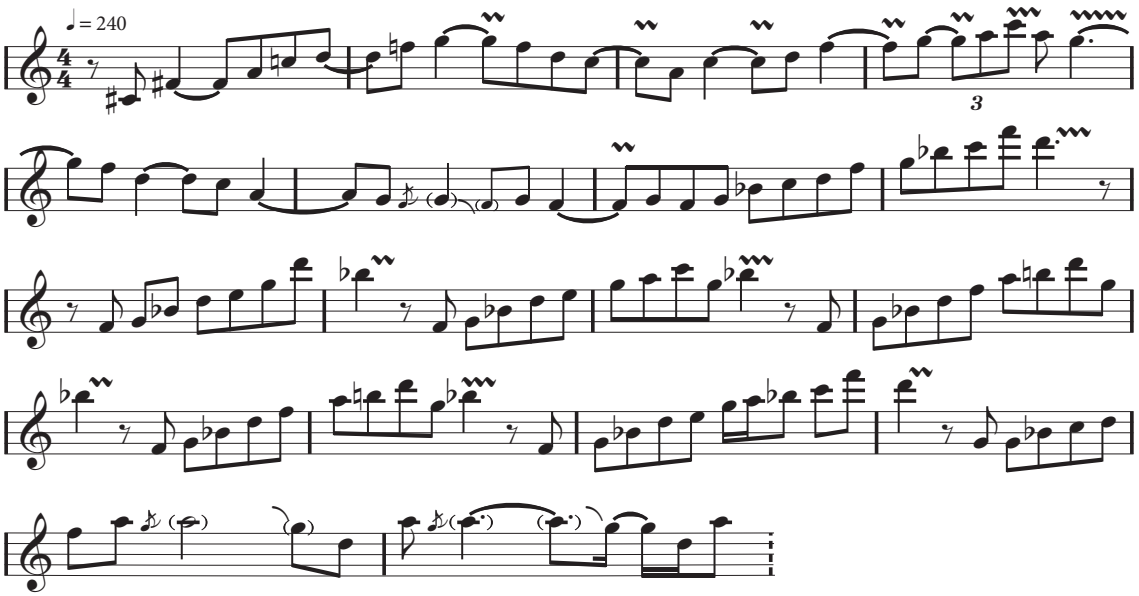
AFTER COVERING HIS SOUND IN THE PAST TWO MONTHS' COLUMNS, IT'S TIME TO PLUNGE HEADLONG INTO THE ACTUAL playing style of Jan Hammer. I could write a whole book on him and still not cover every aspect of his playing, but I've only got space to highlight some obvious elements.

Some Signature Scales

The November and December 2014 "Art of Synth Soloing" columns explored the pentatonic scales, and that is an important building block of Hammer's playing. He has often used superimposed scale choices, not playing the more clichéd blues-oriented sounds (until he stood toe-to-toe with the guitar greats that he often toured with).

As an example, Hammer has often used a minor pentatonic scale a whole step above the chord root, for either a minor seventh or dominant seventh chord. So in the key of *C* this would be using a *D* minor pentatonic scale (see **Ex. 1**). This "avoids" the third of the chord giving the lines an open and colorful sound. You can also think of this as using the major pentatonic scale a fourth higher (*F* major pentatonic in the key of *C*).

Ex. 1. Using a *D* minor pentatonic over a *C* chord.

Ex. 2. *D* major pentatonic w/added 4th over an *Am7/A7* chord.

That leads us nicely into our second example, which is a common way Hammer started out solos on open vamps. Take the major pentatonic (*1*, *2*, *3*, *5* and *6*) and add the fourth and still apply it as before. So now in the key of *A* this would be the *D* major pentatonic with the added *G* note being played over an *Am7* or *A7* vamp (see **Ex. 2**).

Ex. 3 shows his opening phrases from two classic performances. First, his cover of Jimi Hendrix's "Manic Depression" from his sadly out of print *Hammer* album. Next are the opening lines on "Orange and Black," from the *Oh Yeah* album. This approach works well in these instances because no one is comping any chords for the solo, so he is free to stretch out.

Ex. 3a and 3b. Two classic solo opening phrases.

Ex. 4. The "Jan Hammer scale."

Ex. 5. Licks to practice using the "Jan Hammer scale."

Ex. 6. Solo chorus from "Blue Wind."

Ex. 7. Varying notes within repeated phrases.

over them, meaning you move the mod wheel for them.

Another form of repetition that Hammer employs involves the "fusion lick" double bend technique. This is where you bend up to a note, and then play the note again straight, and all of the possible variations of that idea. Hammer is a master of this technique (did he invent it? Possibly so!), varying a pitch here or there, and often changing up the rhythm so the phrase does not occur on the same beat each time. Head online at the link at right to download notation of this riff. ♫

Jan's most signature scale is one he and Jeff Beck share, the mixolydian pentatonic, and as I mentioned in the July 2014 column, it has grown to be called the Jan Hammer scale. It is built using the root, major third, fourth, fifth, and flat seventh (see **Ex. 4**).

Combine this scale with liberal use of pitch bend and you're evoking the Hammer spirit. Try building lines that center on and keep returning to the third of the scale. This lends an Eastern quality to the sound, as if you're playing a more exotic scale (root, minor second, minor third, flat fifth and natural sixth), or even the Locrian mode. See **Ex. 5** for some choice licks to practice.

Lines with Purpose

Hammer is a master at starting with a "germ" of an idea, and building it deliberately. Take his first solo chorus on the classic "Blue Wind" from Jeff Beck's *Wired* album (see **Ex. 6**). He builds the solo melodically by shifting one note at a time, minor third, major third, fourth, and so on. He takes his time and is really singing.

Repeating a phrase and changing one or two notes is a common technique for Hammer, and in **Ex. 7**, I take an example from his burning opening duet with Billy Cobham on "Quadrant 4" from *Spectrum* to show this. The section is on an open *D* tonality, and the first few bars are a normal *F* major pentatonic (ignoring the first two notes).

For the ascending run in bar 7 he shifts the scale to a *G* minor pentatonic by moving the *A* to a *B♭*. On the next iteration (bar 8) he moves the *C* and *D* up to *D* and *E* for a very exotic flavor. And then over the next few bars he keeps developing the line, always shifting a choice note or two as he goes.

Note: some of the notes that sound pitch-bent a half-step or "in the cracks" are really LFO pitch modulation using a square wave rather than the normal sine, or triangle wave. I've marked those notes with a wavy line

SOUNDCLOUD Audio examples.

keyboardmag.com/may2015

Maximize Your Soft Synth Mileage

BY CRAIG ANDERTON

WHILE IT'S TRUE THAT EVEN ENTRY-LEVEL COMPUTERS NOW INCLUDE MULTI-CORE processors and generous amounts of memory, CPU management is still an issue if you plan to use a lot of virtual instruments. Half a dozen instances of a sophisticated physical or analog modeling synth can bring even a power-user computer to its knees. Here are some tweaks to get more mileage out of whatever computer you have.

Shift your CPU's gears. Virtual instruments involve trade-offs, like CPU load versus fidelity versus latency. So, some CPU-intensive instruments let you adjust the power consumption in preferences (see Figure 1). When you're tracking, select modest CPU consumption. When mixing, render the soft synth to an audio track using maximum CPU consumption. Then you can archive the instrument to disconnect it from the CPU—but if your host can't do that, save the instrument's preset and remove it from the host after rendering. If you want to re-edit later, insert the instrument, load the preset, and edit away.

The benefits of recording at 96kHz. I covered this in the September 2014 issue; check out the article online at keyboardmag.com/recordat96. What the article doesn't cover is a workaround if your synth doesn't do oversampling and you're recording at 44.1 or 48kHz. Export the MIDI file driving your virtual instrument, then open a 96kHz project. Insert the synth, load the MIDI file, and render the synth track. Then, sample-rate convert it to 44.1 or 48kHz and import the audio into your original project. Even though it seems counterintuitive that lower sample rates would retain the benefits of initially recording at higher ones, this works.

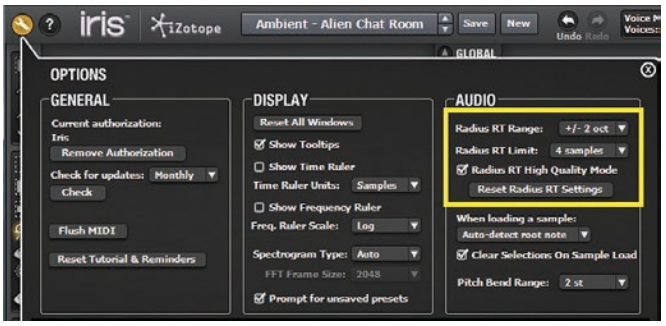


Fig. 1. In iZotope Iris, several user-adjustable audio parameters (outlined in yellow) trade off audio quality for CPU consumption.

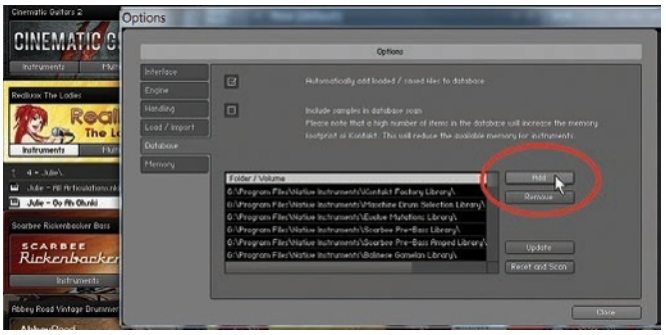
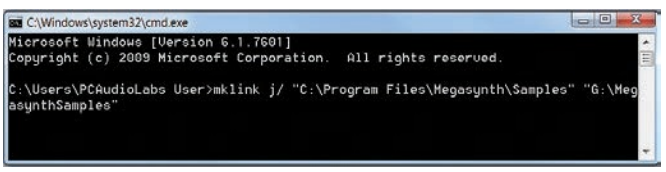


Fig. 2. Native Instruments Kontakt can add and remove sample folders located anywhere on your computer.


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
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C:\Users\PCAudioLabs User>mklink j/ "C:\Program Files\Megasynth\Samples" "G:\MegasynthSamples"

Fig. 3. Windows' "mklink" function directs Megasynth to look in the "MegasynthSamples" folder on drive G for its samples.

Sample library relocation. Although most modern synths let you specify a destination drive to install libraries, what if you later want to move a library to a new or different drive? Create a new folder, move your samples to it, then see if the program's preferences let you enter an alternate folder location (see Figure 2). If not, there may be a configuration text file where you can replace one folder reference with another.

In Windows, sometimes a registry entry points to a sample library location. Because editing the registry is scary, you can use Windows' **mklink** function to create a link from the folder the program references to a different folder. Figure 3 shows an example. Run **cmd.exe** in Administrator mode, then type (without the brackets, but with the quotes):

```
mklink j/ "C:\[file path of existing sample folder]" "[drive letter]:\[file path of new sample folder]"
```

Stream samples from an external USB drive. With a laptop, it's likely that all your sample and audio data lives on your main system drive. If an instrument's samples take up a lot of space, streaming from disk puts an extra load on your system drive, but loading them into RAM may push up against the system's limits. So load an instrument's sample library on a USB thumb drive, then point your sampler to it as described above. Make sure it's a fast drive and at least USB2.0, and if you stream truly dense sample sets (*e.g.*, large orchestral libraries), an external Thunderbolt drive is worth your while.

Lower your latency. Latency is a buzzkill. One solution is a faster CPU, but with Windows, go into Device Manager and disable (do not uninstall) all drivers under "Sound, Video, and Game Controllers" other than any for your audio interface. It can't hurt, and you can always re-enable them for general-purpose use later. It's common to increase your DAW's sample buffer setting as a song becomes more complex, which can be a drag when you need to do an overdub. The remedy: "Freeze" all your virtual instrument tracks to lighten the load on your CPU. Then you can lower the latency, play your part, and when you're done, unfreeze the instruments to re-establish real-time control over them. ♫

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The Odyssey Continues

MAKING CLASSIC SOUNDS WITH AN ARP SYNTH

BY FRANCIS PRÈVE

ONE OF THE BIGGEST REVELATIONS IN USING THE ARP ODYSSEY IS HOW IDENTIFIABLE ITS SOUND TRULY IS, especially if you grew up with synth-pop and new wave music. So for this month's Dance column, we'll dissect distinctive sounds from three legendary dance and electronic artists, all of which you can re-create with an original ARP Odyssey or Korg's reissue (reviewed on page 38). All three of these sounds have become indispensable tools in a modern producer's kit, so read on to discover their roots.

Kraftwerk

While the Odyssey was long part of Kraftwerk's arsenal, even on early albums like *Trans-Europe Express* and *The Man Machine*, there's no mistaking ARP's ubiquitous role in their quintessential synth-pop masterpiece "Computer World." One of the most identifiable sounds from that record is a very tight percussive sound that's essentially a shorter-than-200ms "zap." The Odyssey re-creates this sound perfectly, and here's how to do it.

Start by zeroing out all of the mixer and modulation sliders for the filter section, as this sound will consist entirely of filter self-oscillation. Lower the cutoff to zero and raise the resonance to maximum. Next, switch the modulation for both the filter and amp to the Odyssey's ADSR envelope and raise their modulation levels to maximum—and make sure that the LFO repeat functions are turned off. Finally, set the ADSR envelope parameters as follows: attack at zero, decay at about 3 percent, sustain at zero, and release at (again) 3 percent. If you've followed the instructions correctly, hitting any key will deliver that classic Kraftwerk "thwip."

Depeche Mode

The first two albums from Depeche Mode often included a sound that is undeniably an ARP filter modulated via analog sample-and-hold. You can hear it in the background of "Nothing To Fear" and in the foreground of "The Sun and the Rainfall." While this sound may have been derived from a 2600, the Odyssey absolutely nails it. Critically here, ARP synths could trigger each successive voltage sample via a key-on, so every key press would have different harmonic content, as contrasted with the familiar "the computer is thinking" burble that clock- or LFO-driven sample-and-hold produces when you hold a note.

Start by detuning the oscillators slightly so that they sound rich and warm. Starting with the filter section, set its mixer up so both oscillators are at maximum volume and set to sawtooth waves, with no noise or ring modulation. For the filter, set the resonance to 90 percent and the cutoff to 80 percent. For the ADSR envelope, set values to zero 25 percent, zero, and 25 percent (respectively), and modulate the VCA only; we're going to modulate the filter with the sample-and-hold section, not the envelope. Finally, apply the Odyssey's sample-and-hold section as follows: noise generator only, with the triggering set to "Kybd Trig" so that the voltage sampling is keyed via note events as opposed to the LFO. Finally, raise the S/H modulation amount in the filter to maximum. Bingo—there's the sound that dominated the first two Depeche Mode albums.

Classic rockers take note: If you lower the cutoff slightly but keep the rest of the parameters identical, you'll get the synth sound from the middle of "Life's Been Good" by Joe Walsh. So there!

Nine Inch Nails

While Nine Inch Nails' industrial sound may have more in common with rock than dance music, the dominating leads in "The Hand that Feeds" are worthy of special mention here, as their sonic aggression can be precisely recreated with several features that are unique to the Odyssey.

At its core, the sound depends on duophonic manipulation of ring modulation, so start with a pair of warmly detuned oscillators, then turn both oscillators to zero in the filter mixer and raise the Ring Mod slider to maximum, then set the cutoff to maximum with zero resonance. If you have Korg's re-issue of the Odyssey, switch on the new overdrive feature. For the amp envelope, use the AR envelope with an immediate attack and quick release, with no envelope modulation on the filter. The rest of the sound comes from playing technique: Hit a low key and hold it, then play a rhythmic legato riff on the upper keys. This way, the pitch difference between the two notes will keep the ring modulation constantly shifting, depending on what notes you play. ♫

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KORG ARP Odyssey

Keyboard K KEYBUY AWARD

BY FRANCIS PRÈVE

SINCE KORG'S ANNOUNCEMENT MORE THAN A YEAR AGO, THE WORLD HAS waited for the arrival of their reissue of the ARP Odyssey solo synth. In that time, there's been endless speculation, all of which came to an end at the 2015 NAMM Show this past January. Does the new Odyssey live up to the anticipation? Much more than that, it hits a homer. Let's dive in.

The Backstory

Let's rewind to 1972, when the two commercial synth makers in the U.S. were Moog and ARP. The Minimoog arrived in 1970 and took the music industry by storm, thanks to its combination of portability and a simple but musically useful signal path. In 1971, ARP fired back with the 2600, a suitcase-sized semi-modular with truckloads of features. Artists such as Stevie Wonder and The Who embraced the 2600, but the Mini remained the front-runner due to its convenience.

So ARP made a more portable all-in-one synth that retained much of the 2600's functionality: the Odyssey. The end result had a more complex and flexible signal path than the Minimoog, even by today's standards, and thus the synth wars commenced.

In the decade that followed, synth players were as passionate about "Moog versus ARP" as some people are today about "Mac versus PC." Moog users bragged about the Mini's three oscillators and fat filters while ARP users countered with the Odyssey's extensive modulation tools and tuning stability. By some accounts, ARP was actually more successful than Moog for a time, owning 40 percent of the worldwide synthesizer market in 1977—which by that time included Oberheim, Roland, Korg, and Yamaha.

Despite the Odyssey's success, ARP closed its doors in 1981 and the synth became a much sought-after relic in the vintage world, with three iterations, each with different filter circuits and cosmetics, dominating online auctions for more than 33 years. That is, until Korg announced its collaboration with ARP co-founder David Friend in 2014, resulting in the Odyssey reissue.

Construction

I was expecting the standard Styrofoam end caps to protect the unit during shipping. Instead, I found a gorgeous black briefcase that contained the Odyssey along with its documentation and power supply. This is a treat, as I sometimes take synths to gigs and studio sessions. While I wouldn't check the case as airline baggage, I'd feel confident throwing it a touring van.

The synth itself is 86 percent of the original's size, which means the keys are identical in size to those of the MS-20 Mini. I personally don't have a problem with this scale, since it makes for a more practical footprint in my increasingly crowded studio. What I did find problematic is the fact that the Odyssey's pressure-pad controls for pitch-bend and modulation don't transmit MIDI. While I'm sure there's a technical reason for this, it's a drag because while those proportional controls feel really musical and are essential for many Odyssey leads, I can't sequence and fine-tune those aspects of a performance in my DAW. Sigh.

Architecture

Compared to the signal path of the Minimoog or anything it influenced, it's astonishing how radically different the Odyssey's approach to synthesis is. While based on the classic oscillators-filter-amp paradigm, the Odyssey focuses squarely on modulation—and not just the standard LFO-plus-envelopes schema. Since the Odyssey is essentially a scaled-down ARP 2600, its roots in modular synthesis are reflected in almost every aspect.

There are a pair of oscillators and a noise generator that can be tuned and mixed. These feed the resonant lowpass filter, which is followed by a non-resonant highpass filter. After that is a true VCA, updated by Korg to include an overdrive option. This saturation circuit sounds fantastic and adds girth and weight to the sound without drowning it in distortion.

The modulation tools are extremely unusual by today's standards. While there are two envelopes and an LFO, they're not the usual fare and include several options that make it obvious why the Odyssey was so beloved by early-'80s synth-pop artists. Then there's the sample-and-hold section, which goes far beyond the standard random burbling that most of us associate with that function. Finally, there's an integrated ring modulator, which—combined with the fact that this synth is duophonic—is capable of some really nifty tricks.

Oscillators

The Odyssey's dual VCOs are surprisingly capable, even by modern standards. When the synth was originally released it was known for its tuning stability, and that still stands today. There's a certain sweetness that makes them blend beautifully against other synths in a mix. That said, neither oscillator includes octave or interval controls. Instead, a pair of continuous sliders (coarse and fine) handles tuning for each VCO. This means you'll probably need a tuner or tuning app for gigs, a consequence of a reissue going all in for authenticity.

While waveform selection is limited to sawtooth and variable pulse (which also delivers a standard square wave), several amenities head into ambitious territory. For starters, the oscillators are always in duophonic mode with dynamic voice allocation. That is, if you play a single note,

Snap Judgment

PROS Flawless re-creation of the original Odyssey. Three lowpass filters correspond to three iterations of original. Extraordinary modulation resources. External audio input for signal processing applications. CV, gate and trigger I/O for interfacing with modular gear. Gorgeous, well-made case included.

CONS Only MIDI data transmitted and received are note-ons and note-offs. Many keyboardists won't like the smaller keys. Monaural audio out.

both oscillators are stacked on that key. If you add a second note, the upper note is generated by VCO 2 while the lower note uses VCO 1. This sounds especially cool if each oscillator has a different waveform and tuning, allowing for massive leads that can split into two voices for added flair.

Additionally, the oscillators can be hard-synced and/or used in the Odyssey's ring modulator. While we've seen both features in countless other synths, their interaction with the duophonic approach is stunning. For example, you can tune both VCOs to the same pitch and play a standard monophonic lead, but the minute you add the second note, the timbre changes dramatically and can be *played* with your right hand. In the case of hard sync, this delivers harmonically relevant flanger-like effects. With ring mod, the approach creates nasty, clangorous sidebands *a la* Nine Inch Nails. And yes, you can have both effects happening simultaneously for truly insane results. That said, there's been a bit of online grousing about the fact that the ring mod is based on a digital XOR circuit. I did a bit of research on this and discovered that the original Odyssey also included a *digital* XOR ring mod. So this isn't heresy.

As if that wasn't enough, VCO 1 can also be switched to low-frequency mode, doubling as a second LFO when used in conjunction with the sample-and-hold mixer section. Since the VCO's sawtooth wave is an upward ramp shape, this evoked both Steve Miller and Kraftwerk in certain contexts.

Finally, there's a dual-mode noise generator. Both pink and white noise options are available via a switch at the upper left corner of the front panel.

Filter

In its initial release from 1972 to 1975, the Mk. I Odyssey included a two-pole lowpass filter that had aggressive resonance and a lot of swagger, not unlike mid-'70s Oberheim modules. For the Mk. II, ARP changed the filter to a four-pole circuit that sounded familiar enough to attract Moog's attention. This led to another iteration of the lowpass circuit that offered a similar four-pole roll-off, but with different resonant characteristics. In simplest terms, the Mk. I is brighter and more aggressive, the Mk. II is beefy and clean, and the Mk. III is smooth with much more pronounced resonance.

For this reissue, Korg includes all three filter circuits with a switch to toggle between them. This effectively makes the Odyssey three different synths. That's no exaggeration; each mode is brimming with so much character that switching between them can radically alter the overall sound.

A simple non-resonant highpass filter follows the lowpass filter, and comes in handy when working with the analog, FM, and ring mod options, as these can often add ghostly low-frequency artifacts that wreak havoc with dynamic range and clean mixes. It's also great for whipping up fizzy, mosquito-like leads.

Modulation

The core of the Odyssey sound is its approach to modulation. To begin, two envelopes can be assigned to a wider range of destinations than

The back panel is covered with useful I/O, including five-pin MIDI input, USB bi-directional MIDI, expression pedal and portamento footswitch inputs, 1/4″ *and* XLR outputs, an external audio input, and a set of CV, gate, and trigger ins and outs that play nicely with volt-per-octave modular gear. I tested the CVs with my beloved Oberheim SEM and everything worked great.

the majority of synths from that era. The first envelope is a simple attack-release affair with full sustain, which can be assigned to either the VCA or VCF. The second envelope is a full ADSR source that can modulate the VCA, VCF, and either oscillator's pitch and pulse width, with variable amounts for each, simultaneously. In the context of deeper sound design the results can add either subtle animation to a sound or deliver vintage sci-fi effects. The fact that the oscillators' pitch can be independently modulated also means that classic swept hard-sync sounds are baked right in to the architecture.

The envelopes also include a few triggering options that help explain why ARPs were such mainstays for new wave bands like Depeche Mode and Ultravox. Both envelopes can be switched between keyboard triggering and LFO triggering, allowing either to be used for pulsing rhythmic effects reminiscent of Billy Currie's work with Visage and Ultravox, especially when triggered by a drum machine. I tested this with my Korg Volca synths and it worked without a hitch.

The main LFO simultaneously outputs both sine and square waves, with the choice of wave determined at the modulation destination. For example, VCO 1 can receive either square or sine in varying amounts, while VCO 2 can receive only the sine. The filter is also sine-wave-only, but the previously mentioned envelope triggers are derived from the LFO square wave. As with the envelopes, the fact that each destination includes its own depth slider makes the LFO far more flex-

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ible than the standard approach of a single waveform to pitch/filter/amp.

Another killer app of the Odyssey lies in its complex sample-and-hold section, which operates more like the 2600 than might be immediately apparent. Many newcomers to synthesis think of sample-and-hold as "the random waveform" and while that's acceptable shorthand for the majority of synths, it's only partially accurate. Yes, a random waveform can be derived from a sample-and-hold circuit, but in the Odyssey, you're only scratching the surface.

Proper sample-and-hold circuits include two main components: an LFO and an audio input. The LFO is a square wave that serves as a clock that takes "snapshots" of whatever voltage is present at the audio input, then "holds" that snapshot for a brief time before taking another and spitting out the result as a new voltage. Speed up the LFO rate and you increase the frequency of the snapshots.

When you use noise as the audio input of the circuit, the rapidly shifting frequencies being sampled (hence the name) result in a randomly changing stepped output. Since most synths use noise as the audio source, many keyboardists assume that this is the only result. In addition to pink and white noise sources, the Odyssey's sample-and-hold section also includes the ability to blend an input from VCO 1, which as I mentioned, can also be switched to low frequency mode for use as an LFO.

So, if you select a ramp sawtooth output of VCO 1, switch it to low-frequency mode, and use it as the audio input for the sample-and-hold section, the result will be a chopped rising sound that resembles an atonal upward arpeggiator. Use a square wave instead and you get an alternating pitch that pulses. Mix in some noise and you get that random effect, but with a bit more predictability based on the waveform from VCO 1.

Making matters even more complex is the Odyssey's option to use the keyboard trigger as the source of the snapshot, so that every time you hit a key the output changes. This is a great way to keep things rhythmically locked, especially when you're sequencing the Odyssey via USB MIDI.

Destinations for sample-and-hold include the pitch of each VCO and the VCF cutoff, but it goes deeper. In addition to the sample-and-hold feature, you can use its mixer as a modulation source for analog FM effects, like routing the output of VCO 1 to modulate the cutoff of the filter or using the noise generator to gently modulate the pitch of VCO 2, adding a slight quiver to the pitch.

Conclusions

To say that the ARP Odyssey reissue is a true connoisseur's synth would be understatement of the highest order. On one level, it's a slice of history with an instantly recognizable sound. On another, it's arguably one of the most complex analog solo synths on the current market, with routing flexibility approaching modular synths. Its sound is timeless and whipping up new patches will teach new users a *lot* about the art of synthesis. Get one now. ♫

Bottom Line

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ROLAND JD-Xi

Keyboard K KEYBUY AWARD

BY JIM ALFREDSON

REJOICE, SYNTH ENTHUSIASTS, FOR ANOTHER CONTENDER ENTERS INTO the analog resurgence. With the release of the miniaturized JD-Xi, Roland presents its first foray into analog synthesis since 1986. But wait, this isn't solely a monosynth like the Korg Monotron or Moog Phatties or Arturia's Brute family. The JD-Xi boasts a hybrid design with an integrated (and powerful) polyphonic digital sound engine and sequencer, designed for professional players and non-keyboardist producer types alike.

Overview

The JD-Xi has four multitimbral parts in total. One of these is the analog section, which consists of a single monophonic oscillator with three selectable waveforms, a sub-oscillator that can be set one or two octaves down, a pulse width modulation knob, and an analog 24dB-per-octave lowpass filter.

That's accompanied by two PCM-based digital parts and a dedicated drum synth that share 128-voice polyphony between them. Add four digital filters for the digital sources, a concise and usable effects section, a vocoder, and a sequencer with up to 32 steps for each of the four Parts, and the JD-Xi is a very powerful little beast.

It feels like a lot of thought went into the layout of the JD-Xi to ensure that navigation is as intuitive as possible despite the small footprint. Some functions are accessible only via menu-diving, but the four Part Select buttons (which double as part mutes) are prominent and glow red when engaged. Select a part, and all the other shared control sections (labeled Filter, Amp/Env, LFO, and Effects) change only that part.

One of my favorite features is the big Category knob, reminiscent of the MicroKorg. This knob cycles through different categories of sounds for the two digital parts. That's helpful as Roland has packed over 256 sounds for these digital parts into the JD-Xi, with more promised on the new Roland Axial website.

The two digital parts and the analog part (but not the drum part) each get their own LFO. The main parameters are accessed via knobs on the front panel with a button to determine the modulation destination. All destinations can be used at once but they all share the one LFO for that Part. Tempo sync and alternate modulation destinations are available in the menu.

Also onboard is a mic input for the vocoder (a gooseneck mic is included), a line or guitar-level input on the back for same, octave up and down buttons, and a capable arpeggiator with 128 varied patterns but no user pattern slots.

The Digital Side

As mentioned, the JD-Xi is divided into four Parts. The first two are Digital Synth 1 and 2 and these utilize Roland's ubiquitous "SuperNatural" synth engine; this is essentially sample-based, but with intelligent articulation switching in response to how you play. All the sonic bases are covered: acoustic and electric pianos, organs and pads, strings and brass, analog emulations, guitars, tuned percussion, and one-shot FX sounds. The variety and quality of the sounds is surprisingly good. The acoustic piano is certainly not going to replace your weighted stage piano, but everything is more than usable within the context of the target market. Analog emulations such as "JP-8 Strings" and "Poly Brass" are especially notewor-

Snap Judgment

PROS Huge amount of high-quality sounds and features in a small footprint. Hybrid design is very flexible. Includes real analog monophonic synth section plus two polyphonic digital sections plus drum machine. Fun to play.

CONS Some menu-diving is required to maximize synth's capabilities. Effects sends are global only. Vocoder disables the analog synth section. Tiny keys feel clumsy to seasoned keyboardists.

thy. Some beautiful pads, atmospheric electric pianos, and playable leads are also standouts.

The vocoder tones are really fun and work great with the included mic. A neat feature of the vocoder is a button under the mic labeled Auto Note. This detects the note you're singing and plays it automatically as if you're playing the keyboard.

Filters for the digital parts include lowpass, highpass, bandpass, and peaking with resonance. Each part gets its own filter. Although digital, the filters have a wonderfully vintage sound.

Each digital part also has its own envelope generator with two knobs on the front panel. More control over the envelope and a filter envelope per part can be accessed from the Tone Edit menu.

Each part also has a separate LFO with six waveforms, three panel-accessed modulation destinations, and dedicated knobs. Again, more options are available in the menu including other destinations and tempo sync. The tempo sync feature is fantastic and allows instant "wobble" effects by twisting the LFO Rate knob.

Next on the digital side is the Drum Part, which is definitely not an afterthought. It boasts 33 kits based on samples of Roland classics like the TR series and the venerable CR-78, as well as acoustic, house, EDM, and hip-hop kits. Each kit has 26 tones, including three kicks, four snares, toms, percussion, and miscellaneous sounds. The filter and amp envelope controls in the drum section are per note; meaning you can adjust them for kick, snare, claps, or other sounds individually. At present there doesn't appear to be any way to apply changes to the entire kit at once, so you can't do epic whole-kit filter sweeps. You can, however, edit each note of the kit right down to the waveform used, and create your own custom kits.

The Analog Side

As mentioned, the monophonic analog section consists of a single oscillator with either a sawtooth, triangle, or square wave with variable pulse width modulation, plus a 24dB four-pole lowpass filter. It really reminds me of the TB-303 bass synth: raw and immediate with a funky edge. Unlike the TB-303, however, the filter will self-oscillate at high resonance settings. The filter's four-stage ADSR envelope is not accessible via the front panel but rather in the Tone Edit menu.

In fact, there's quite a bit more buried in the menu such as another ADSR envelope for amplitude, which can be controlled by the single envelope shape knob--see the sidebar on page 44 for more on how this works.

The menu also opens up access to portamento, legato, LFO tempo sync, pitch-bend range, filter and amplitude key follow, and depth of pulse width modulation. You can assign the PWM to the LFO in the menu. The 64 factory presets illustrate the variety of sounds the JD-Xi's simple yet effective analog section is capable of creating.

Effects

Roland has included a small but useful variety of effects. All effects sends are global, but you can bypass each effect independently for each part. The four busses are Effect 1 (distortion, fuzz, compressor, or bit-crusher), Effect 2 (flanger, phaser, ring modulator, or slicer), Delay, and Reverb.

Overall, these effects sound great. Delay can be tempo synced to numerous subdivisions of the beat or run free with delay times going all the way to 2,600ms. Six reverb types are available with a maximum decay time of around four seconds. The modulation effects are rich and have a lot of options in the menu. Distortion and grunge are obligatory in today's synths and the JD-Xi offers a good selection.

Left to right: Power jack, on/off switch, USB port, five-pin MIDI in and out, line/guitar switch, audio input, stereo audio outputs, and headphone jack.

Sequencer

The sequencer is quite versatile despite its simplicity. Echoes of the TB-303 are especially apparent here. The steps can be set to eighth-note triplets, sixteenth-notes, or 32nd-notes and can be one, two, or four 4/4 measures in length, set in the menu. Note-value bars printed on the panel above the 16 backlit TR-Rec buttons illustrate these subdivisions. Each of the four Parts gets its own sequencer track. The Drum Part functions as expected; each note (drum sound) gets its own track. You can record in step mode or real time, and a menu provides a click that can be audible either on record, playback, both, or continuously. The click can also be assigned to the right output only.

I found the sequencer very intuitive to use: Select the part you want, press the Real Time Rec button, and play. The notes are automatically quantized and the recording stopped at the end the pattern while the playback loop continues. Step Record is also very easy with the help of the 16 red-highlighted buttons representing the steps. While a menu lets you set pattern length to one, two, or four bars, there doesn't appear to be any way to set odd step lengths (a straightforward procedure on Roland's Aira TR-8 drum machine) for proggy time signatures.

Driving the Hybrid

The combination of all four parts is called a Program, which includes any information played into the sequencer (a Pattern). There are eight banks of 64 Programs each in the JD-Xi. The first four banks are factory presets and can't be overwritten; the next four can. It doesn't appear to be possible to save individual parts separately from Programs. If you create a new sound with just the analog part, for example, the only way to save it is within a Program, with all other Parts and sequencer data along with it.

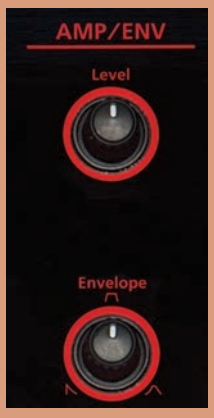
I found the JD-Xi remarkably easy to use considering all the different sections and parameters available. It's very simple to get going and create a new Program with a drum track, a nice monophonic analog bass or lead synth, and some chordal instruments from the digital side. The sounds themselves are very high-quality. Although rudimentary, the analog section has a lot of character. You can coax a wide variety of timbres from it with ease.

The vocoder is fun, and a gooseneck mic is included. You can also plug in a guitar or other instrument and use that as the vocoder's modulating signal. You can't sequence the vocoder for obvious reasons—the JD-Xi is not a sampler. You also can't use the vocoder and the analog synth at the same time, which would imply that the vocoder uses the analog section as its carrier signal. But the vocoder is capable of chords whereas the analog part is monophonic, so that's not what's going on. In fact, the JD-Xi has sufficient CPU resources to manage four multitimbral parts, so it's simply that the analog side is what gets turned off if you bring in the vocoder.

I do have a few minor issues with the JD-Xi. The amount of menu diving required to access certain parameters is sometimes a little frustrating. For example, editing the filter envelope generator—a toggle button to switch the Amp/Env between amplitude and filter would be a nice touch. Once you're in the menu hierarchy, changing the value of parameters is time consuming because you have only the + and - increment buttons; a data dial would be most welcome here. The lack of the famous Roland ensemble effect or even just chorus is also odd. Adding chorus to a single analog oscillator is a quick and easy way to fatten it up. Finally, I wish the level of the sub-oscillator were independently adjustable.

Conclusions

Roland has delivered an exceptionally fun and powerful little synth in the JD-Xi. The sound quality is stunning, and the variety of sounds is immediately useful. I can see myself using this synth in many roles: as a scratch pad for song ideas, as a lead and bass synth both live and in the studio, and as a very functional and quick drum machine. The hybrid concept is not only intriguing and smartly executed, but also offers much more instant gratification for beginning musicians and producers (keyboardists and non-keyboardists alike) than any of the recent monophonic-only analog synths. However much Roland's marketing of the JD-Xi skews toward "groove" or EDM, the real story here is that you get a two-part multitimbral digital synth, plus a real analog monosynth, plus TR-style drums and sequencing, all usable at once, in a package that's the price of an iPad and not much bigger. That makes it the new king of the mini-synth hill and a clear Key Buy in our book.



TWO-KNOB ENVELOPES

Instead of the four-stage envelope controls available on most knobby synths, the JD-Xi offers a simpler, two-knob approach. The Level knob sets the overall volume. The Envelope knob controls all four stages (attack, decay, sustain, and release) of the envelope generator at the same time. Starting from the middle position and turning the knob to the left makes the sound shorter and the attack stronger. Turning the knob to the right softens the attack and lengthens the sustain and release. Once you learn the knob's "waypoints," it becomes a very immediate approach for quickly shaping the sound you want. In live performance, grabbing one knob to go from a snappy lead or comping sound to a squishy, evolving pad can make a lot more sense than fiddling with four. For more precise control, all four stages can be edited individually in a menu.

Bottom Line

Powerful multitimbral and sequencing abilities plus a real analog section make this the new micro-keys synth to beat.

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CENTER POINT STEREO

Spacestation V.3

BY DAVID BRYCE

ONE WOULD BE HARD PRESSED TO FIND A CONSENSUS AMONGST KEYBOARD players as to the best way to approach onstage amplification. Most of us have tried all sorts of things, from all sizes and configurations of combo amps (including ones meant for bass and guitar) to full-blown small P.A. systems (both mono and stereo) to in-ear monitors, but nothing has ever risen head and shoulders above everything else as the Holy Grail of keyboard amplification. Aspen Pittman and his team (whom you may know from Groove Tubes) have been working for years on a way to get stereo out of a single unit. Although there are other manufacturers that offer combo amps purporting to deliver stereo performance, none approaches it in the same manner as Pittman's "center point stereo" (CPS) design. What makes the latest incarnation of his Spacestation so different, and does it actually deliver the goods?

Snap Judgment

PROS Fabulous sound. Small footprint. Lots of power.

CONS Unit has no pole mount. No built-in dedicated direct out.

Overview

Standing a foot and a half tall by 11 inches on either side, the SSV3 (for short) is quite the compact unit; however, don't be fooled by its size. It weighs in at 32 pounds, which is a touch more than one might expect given its size but is fully understandable give the amount of firepower it's packing. Under the hood are four drivers: an 8" Eminence woofer, 6.5" side-facing speaker, 1" Eminence compression mid driver (mounted coaxially inside the woofer) and 1" super tweeter. A bunch of separate amps drives 100W each to the two woofers and 40W each to the mid and HF drivers. A sturdy cage-type grill protects the front of the enclosure, and the side panels have peculiar shapes cut out of them to allow the side speaker to radiate properly. The back panel is quite simple, featuring a pair of 1/4" balanced

stereo inputs and a single full-range TRS output, marked Sub Out, which can also be used to feed a direct signal to the house P.A. Only four controls are provided: CPS Level (volume) and Width (stereo separation), plus a pair of knobs that allow you to tailor the mids and highs to taste. The unit has an internal power supply, but it's not universal—it has to be set at the factory for either 120V or 220V operation.

There is no way to mount the SSV3 on a pole on its own, but since it performs the best when sitting on the floor that's not really a problem. The manufacturer actually recommends not only putting it on the floor, but also (when possible) tilting it back and leaning it against a wall as well.

In Use

I used the Spacestation in my studio, in the big room where my grand piano lives, at a rehearsal, at an outdoor jam, and at a gig. While I had a lot of fun with it at home and in the studio and managed to get a handle on tweaking the controls to my liking, using it in live environments with other musicians is really where it shone. I tried it in rehearsal on an amp stand at first, but it didn't sound as good as I expected, and both guitar players in the band commented that they were having trouble hearing it. However, as soon as I set it on the floor about six feet behind me and leaned it up against the wall, it was like a switch had been thrown. Everyone in the band commented right away that they had never been able to hear my parts as clearly, and that they were really surprised that I didn't have to turn it up more.

The simple rear panel offers balanced TRS stereo inputs, a sub out, and controls for stereo spread and mid and high EQ.

The CPS process actually seems to make the amp easier to hear, and even to converse around at lower volumes. I did have to tweak the controls to taste, of course—I found that I liked the mids dialed back to about 10 o'clock and the highs boosted just a touch (about one o'clock). The Width control took a minute to get used to, but I seem to have settled on keeping it just a hair short of the center position. My keyboards are mixed with a Yamaha MG06, so I just set the SSV3 volume to the center position, and got more than enough volume with no distortion.

As far as bass response, I actually owned the last incarnation of the Spacestation, and the lack of bass was one of the things that kept me from using it much. That has clearly been addressed in version 3. The new Eminence drivers and a ton of power provide a surprising amount of bass—certainly enough for my taste, but then again, I'm not kicking organ bass pedals or playing really big venues. For those really looking for some thunder down under, pairing the unit with a subwoofer is probably the way to go. I did exactly that with my Motion Sound SW15 at the outdoor jam, and I found it took the SSV3 to a whole other level. With a sub, in fact, it's loud and clear enough to be used easily even in demanding applications.

Conclusions

There are two distinctively striking things about the SSV3 for me that separate it from the pack. The first is that even though the unit was positioned behind me, the sound came from all around me and enveloped me. I've been trying to achieve something like that for years—setting cabinets in a V-shape behind me, putting one behind me and one in front of me, putting one next to me and one on the other side of the stage—but nothing else has come close to delivering what I get out of the SSV3. The second, which I really like, is that because of the way that it processes and projects the sound, I can actually play at a stage volume that allows me to be heard in the audience, yet doesn't blow my ears out or make my band members angry at me. While I do not believe there is such a thing as a "Holy Grail" amp, as every one's tastes and situations are different, the SSV3 is as close as I can recall getting to one, and certainly does stereo better than any single-cabinet solution I've ever used. I have a strong feeling there's a credit card charge I'm going to have to explain to my wife very shortly. ♫

VIVE LA DIFFÉRENCE

What makes the SSV3 different from other stereo amps is that the stereo left and right feeds are encoded as mid (basically center) and side (basically ambience/directionality) signals, then decoded using proprietary front and side dipole speaker arrays The side speaker is 90 degrees off-axis. The result is a stereo image that's the same everywhere in the room; and, as unbelievable as that may sound, it actually works incredibly well. You don't get the conventional left-right image delivered by two individual speaker enclosures, but the separation between the two sides is quite apparent, especially on things like organ programs with rotary effect, chorusing, flanging, delays, and multis with elements placed across the stereo field. No matter where you are, you can hear all parts of the signal—no more having audience members not hear the left side because they're overpowered by the right speaker.

Bottom Line

Unprecedented presentation of stereo sound from a single, well-built, easy to move unit.

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centerpointstereo.com

Join the Discussion!
Talk about the CPS Spacestation V.3 with *Keyboard*'s online forum community.

keyboardmag.com/may2015

ARTURIA iProphet

BY FRANCIS PRÈVE

Snap Judgment

PROS Faithful re-creation of the Prophet-VS vector synthesis engine. Intuitive interface design makes managing oscillators and blending a breeze. Multimode filters. Integrated chorus, overdrive, and delay.

CONS The user-designable waveform tools of the Prophet-VS are not included, nor is its innovative arpeggiator.

Bottom Line

A classic in your backpack.

$4.99
arturia.com

DESPITE ITS RELATIVE OBSCURITY, THE SEQUENTIAL PROPHET-VS WAS ONE OF the most innovative synths of the mid-'80s. Released just a year before the company was sold to Yamaha (and products discontinued), the Prophet-VS unleashed an entirely new form of waveform manipulation for synthesists. Called "Vector Synthesis," this method of tone generation was based on four digital oscillators, each with its own waveform and tuning, that could be blended in real time or via a set of automation tools that blurred the line between envelopes and LFOs. The results were similar to the PPG Wave's ability to scan through a wavetable and shifting timbres, but far more flexible, since the VS was able to transition smoothly between a much wider variety of harmonic spectra.

Arturia's newest iOS app iProphet is an impressive re-creation of the VS sound, incorporating nearly all of the original's features into a much more intuitive interface, and adding a few essential effects that thicken the sound nicely.

The original Prophet-VS oscillator topology is reproduced faithfully here. Each of the four oscillators includes coarse and fine tuning for an array of 95 single cycle digital waves that cover a lot of sonic ground and have a distinctly vintage '80s vibe. Once you've adjusted these options for each oscillator, you can then mix and blend them via a virtual joystick to create really deep textures or (with a little advance planning) chords.

Things get a lot more interesting when you apply Arturia's visual implementation of the VS' envelope-based mixer for the oscillator blending. Here, you can specify five different joystick positions and then set the transition times between each point, allowing you to shift smoothly between waveforms and tunings. What's more, this envelope can be set to loop between a variety of positions, allowing for LFO effects. The end results can range from shimmering animated pads to percussive patches that quickly whip through timbre shifts in clever ways. While there are other modern iOS synths that perform similar tricks, the VS interface distinguishes iProphet from the competition.

From there, the rest of the iProphet's synthesis engine covers the classic analog/subtractive territory, but with a few improvements and modern Arturia enhancements. For example, iProphet retains the original's innovative five-stage envelopes for the filter and amp—each with separate parameters for level and time—but with the enhancement of being graphically editable. As for the filter, it's got the standard complement of cutoff, resonance, and envelope amount, but Arturia also gave it modern multi-mode options. The tempo-synced dual LFOs cover familiar territory, with controls for rate and the five essential waveforms: triangle, square, saw up or down, and random.

Another enhancement is a pin-based modulation matrix, evocative of the legendary EMS VCS3. Here you can route the LFOs, envelopes, keyboard tracking, modulation wheel, and iPad accelerometers to a variety of iProphet's synthesis functions. Interestingly, the depth of modulation is governed in a semi-global way for each modulation source. For example, you can route the filter envelope to the frequency of oscillators A and D, but the amount will be the same for both. This isn't a drawback, as this "limitation" gives iProphet some extra character.

While iProphet doesn't include the original's unusual arpeggiator, it does include its chorus, along with an overdrive stage and a stereo delay. As for iOS communication, there's Audiobus, Core MIDI, Apple Inter-App audio, and even Tabletop if that's your preferred standard.

All in all, iProphet is a knockout classic synth emulation for the iPad, and for a mere five bucks, an obvious Key Buy. ♫

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ERICK MICHAEL ROMAN

5 THINGS I'VE LEARNED ABOUT Maintaining Vintage Electro-Mechanical Keyboards

BY CHRIS CARROLL

Chris Carroll is founder and president of Vintage Vibe. In addition to being the only company in the world currently manufacturing electro-mechanical tine pianos, Vintage Vibe restores and repairs vintage keyboards and manufactures aftermarket replacement parts. Notable users of the Vintage Vibe piano and Vibanet (a modern-day Clavinet replacement) include Stevie Wonder and Greg Phillinganes. Find out more at vintagevibe.com.

FOR ALMOST 20 YEARS, I'VE SPENT THE MAJORITY OF MY TIME AROUND vintage keyboards. It all began when my tech and mentor Jeff Blenkinsopp asked me to join his company E.A.R.S. in New York City and run the keyboard department. I learned in the trenches how to troubleshoot and take things apart, and we didn't have the plethora of online resources that are available today. Over time, I learned many things and created systems for restoring electric pianos. To this day, I apply these strategies to the work I do at Vintage Vibe. Here are five things I've learned about maintaining vintage keyboards.

1. Educate Yourself

Read manuals thoroughly and watch videos on electric piano repair as much as possible. Open up your instrument and become acquainted with its inner workings. Once you have an understanding of its mechanical operation, start experimenting by making small adjustments on a single note to see and feel how the tone and action are altered. Note what works and what doesn't. These findings will allow you to change your instrument effectively and fine-tune its sonic possibilities. It's at this point that your journey begins and your relationship with your muse deepens.

2. Be Cautious, Not Afraid

When you first lift the lid of an electric piano and take a look at its inner workings, the thought of attempting a restoration or even a minor repair can be daunting. However, finding the courage and time to take on the job can be extremely rewarding. Electric piano actions are based on simple mechanisms. By understanding the principles of these mechanisms and remembering that every action causes a reaction (and often multiple reactions), you can optimize your piano's performance. Nowadays, most of the parts needed for repairing or restoring your vintage keyboard are readily available for purchase. Don't be afraid—there's help out there if you get stuck!

3. Make a Repair Plan

Time is money. So in order to waste less and save more of it, plan your restoration or repair in a logical order. Always start with the keybed, as this is the foundation of your piano. Everything is affected by this groundwork and if you don't address it first, you may encounter issues later that could've been prevented. Set the ideal key height for the lowest and highest notes on your instrument, then level all other keys to this height. Square any horizontally misaligned (or slanted) keys. Ensure proper key dip. And, if applicable, check the aftertouch. With careful planning, you won't have to spend extra money and waste time going over the same tasks twice.

4. Align Your Strike Line

In my experience, whether it's a Rhodes, Wurly, or Clavinet, the point at which the hammer strikes the tone source is of utmost importance. Setting the strike line correctly can be the difference between a note that has a rich fundamental and a complexity of harmonics, and a note that's dull and lacking in character. Many a tine or reed have been needlessly replaced due to an improperly set strike line. The sweet spot of the strike line can be altered with mechanical adjustments to the hammer or harp. In addition to the strike line, the relationship between the tone source (tine, reed, or string) and the actuator (hammer or tip) plays a major role in the tone that's produced, and should be observed and experimented with as well.

5. Factory Specs Aren't Necessarily Optimal

You'll often hear technicians talk about restoring a vintage keyboard to "factory specifications." This is something to be wary of. Most electric pianos were built to dimensional standards in order to accommodate mass production on assembly lines, and therefore most always need tweaking for optimization. That's why a proper setup is so important. You can achieve great feel and tone on your instrument just by articulating the parameters I've addressed in this article. A proper setup can turn an average electro-mechanical piano into a dream machine.

Chris Carroll discusses adjusting the strike line of a Wurlitzer electric piano.

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